

# INDIA MARK-II HAND PUMP INSTALLATION AND MAINTENANCE MANUAL



2056



INDIA MARK-II DEEP-WELL HANDPUMP IN OPERATION



## COMMUNITY HEALTH CELL

CON 47/111 Mark's Road, Bangalore - 560 001

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**COMMUNITY HEALTH CELL**  
**326, V Main, I Block**  
**Koramangala**  
**Bangalore-560034**  
**India**



# **about you and hand-pumps**

## **Why was the India Mark II Deepwell hand pump developed?**

Hand pumps in villages are used by many people. Sometimes they are used for 18 hours a day or even more. Because of this, hand pumps of improper design and sub-standard quality, break down quickly.

The India Mark II Deepwell pump is made of very strong materials. It is the best hand pump made so far. It seldom breaks down. All the parts are checked and tested, so that they fit together perfectly. This means that you don't have to force the parts together.

## **Why is water from a hand pump better than water from other sources?**

Water from streams, ponds, stepwells and open wells usually carry disease causing germs. In the case of India Mark Deepwell hand pump the tubewell is sealed so that harmful germs cannot enter. The water is drawn from deeper strata and hence the Deepwell Hand Pump is one of the safest sources of clean potable water.

If people want to stay healthy, they must have clean drinking water. If they take polluted water they are likely to fall ill.

The hand-pump brings clean drinking water to the villagers. So it is important that the hand-pump does not fail. The hand-pump must work well and work for a long time.

## **Why is your job so important ?**

The hand-pump should always bring good, potable water to the villagers. If you install the hand-pump correctly, then it works properly and will need very little maintenance. So if your workmanship is good, then you are helping the villagers to stay healthy.

## **Do you drink only clean water ? Do you set an example to the villagers ?**

For your own benefit, you should drink water only from the India Mark-II Deep-well Hand-pump, or water which you know is safe. When you work, the villagers will offer you water. Ask them where it comes from. If it is from an open well, or a pond or from a stream, don't drink it. Tell the villagers that you drink only hand-pump water, because it is safer. Advise them to do the same. In this way, you will set an example to the villagers.

The villagers can see that you are healthy. They can see that you only drink protected water. You do *what you say*. Your example will show the villagers that clean water is connected with good health.

In this way you can teach the villagers some very important things.

You can teach them to value their hand-pumps more, and to look after their hand-pumps better.

Then the hand-pumps which you install will work better and last longer, so your work will be easier, and the villagers will be more healthy.

Many children will grow up healthier because you provided them with good drinking water. You can be proud of your work.



# **about the villagers and hand-pumps**

**What should you tell the villagers when you install or repair a hand-pump ?**

Here are four important things about hand-pumps. You should help the villagers to understand these things:

## **one**

Deep-well hand-pump water is *better than water from other sources*. Water from rivers and ponds can contain disease carrying germs. If we drink this water, we can get ill. But the water from a hand-pump is protected from disease causing germs. So if we drink water from a hand-pump, we will stay healthy.

## **two**

*People must use hand-pumps properly.* You should show the villagers how to use the hand-pump correctly.

## **three**

*People must maintain hand-pumps properly.*

## **four**

*The villagers must contact the appropriate officials if the hand-pump breaks down.* You should tell the villagers exactly whom to contact, and how to contact

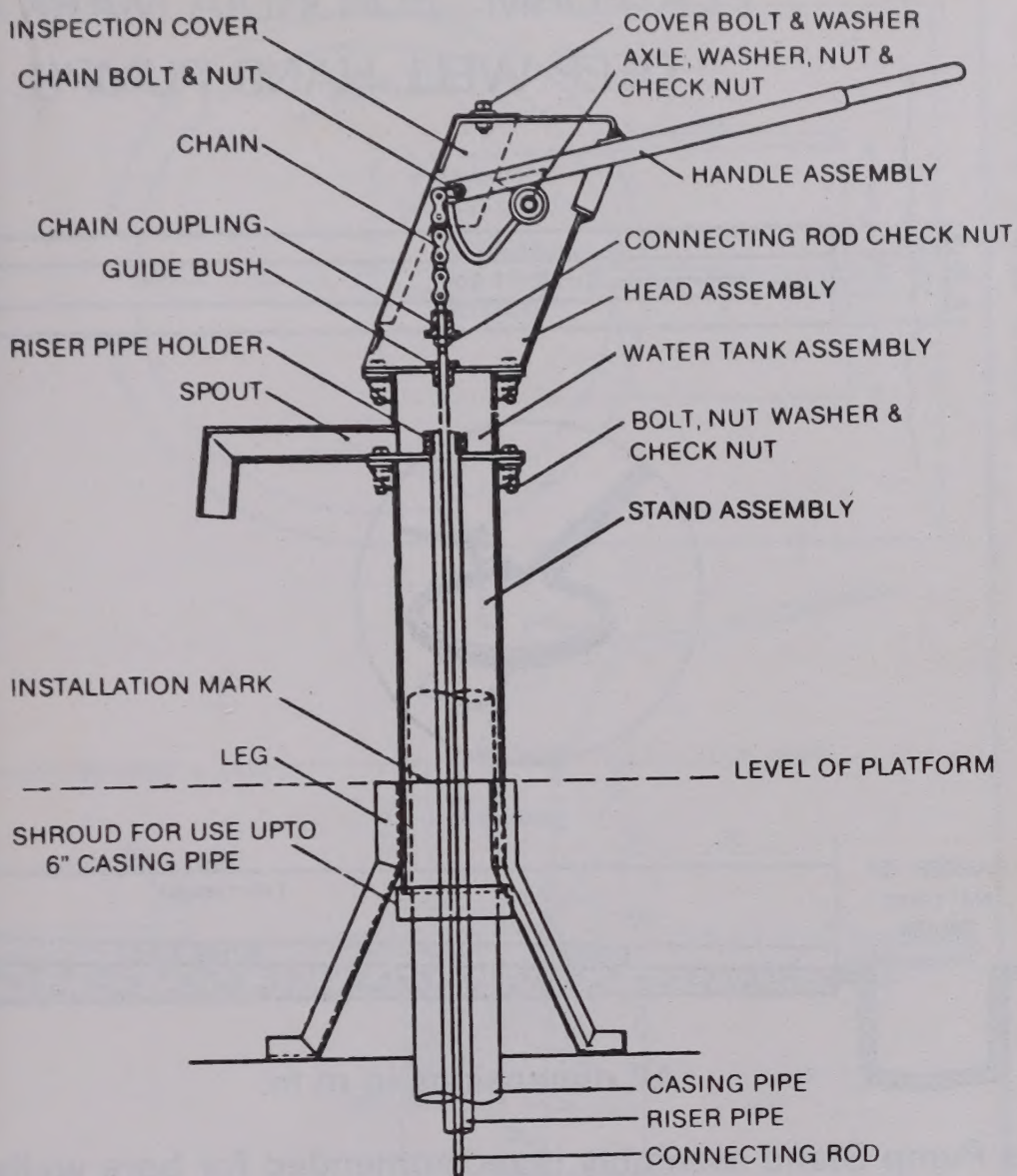
## Here are some “do’s” and “don’ts” for hand-pump users :

Do	Don't
<i>Do use the pump gently.</i>	<i>Don't use the hand-pump roughly</i>
<i>Do operate the handle with long, slow strokes.</i>	<i>Don't operate the handle with short, quick strokes.</i>

## Here are some “do’s” and “don’ts” for maintaining hand-pumps:

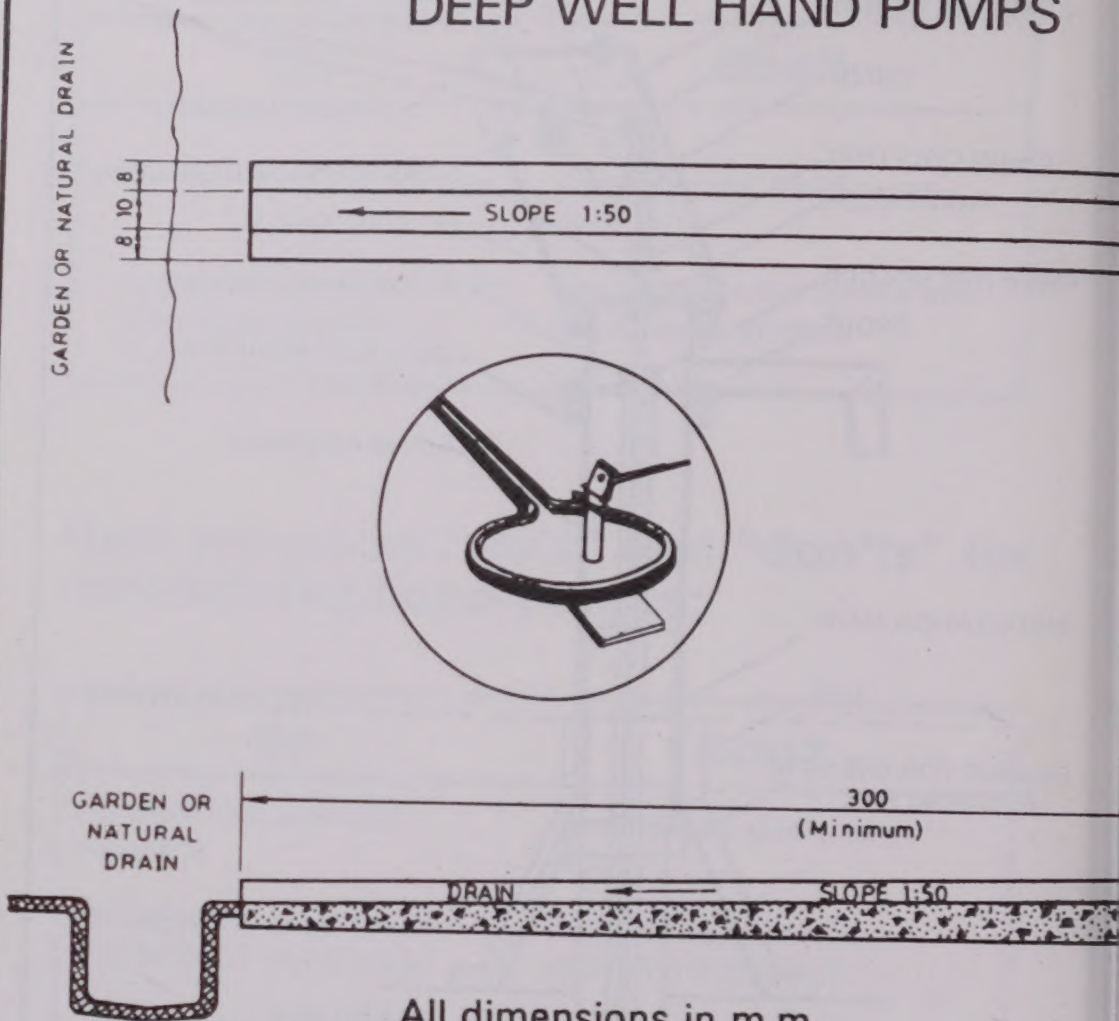
Do	Don't
<i>Do clean the platform regularly.</i>	<i>Don't let the platform get dirty.</i>
<i>Do keep the area around the platform dry &amp; clean.</i>	<i>Don't let water collect around the platform.</i>
<i>Do make sure that no one throws rubbish near the pump.</i>	<i>Don't let rubbish collect near the pump.</i>
<i>Do keep the drain clean.</i>	<i>Don't allow the drain to get choaked with dirt and rubbish.</i>
<i>Do make soakpits away from the pump.</i>	<i>Don't make soakpit close to the pump.</i>
<i>Do keep animals away from the pump.</i>	<i>Don't allow animals to defecate near the pump.</i>





**SECTIONAL DETAILS  
OF PUMPHEAD ASSEMBLY**

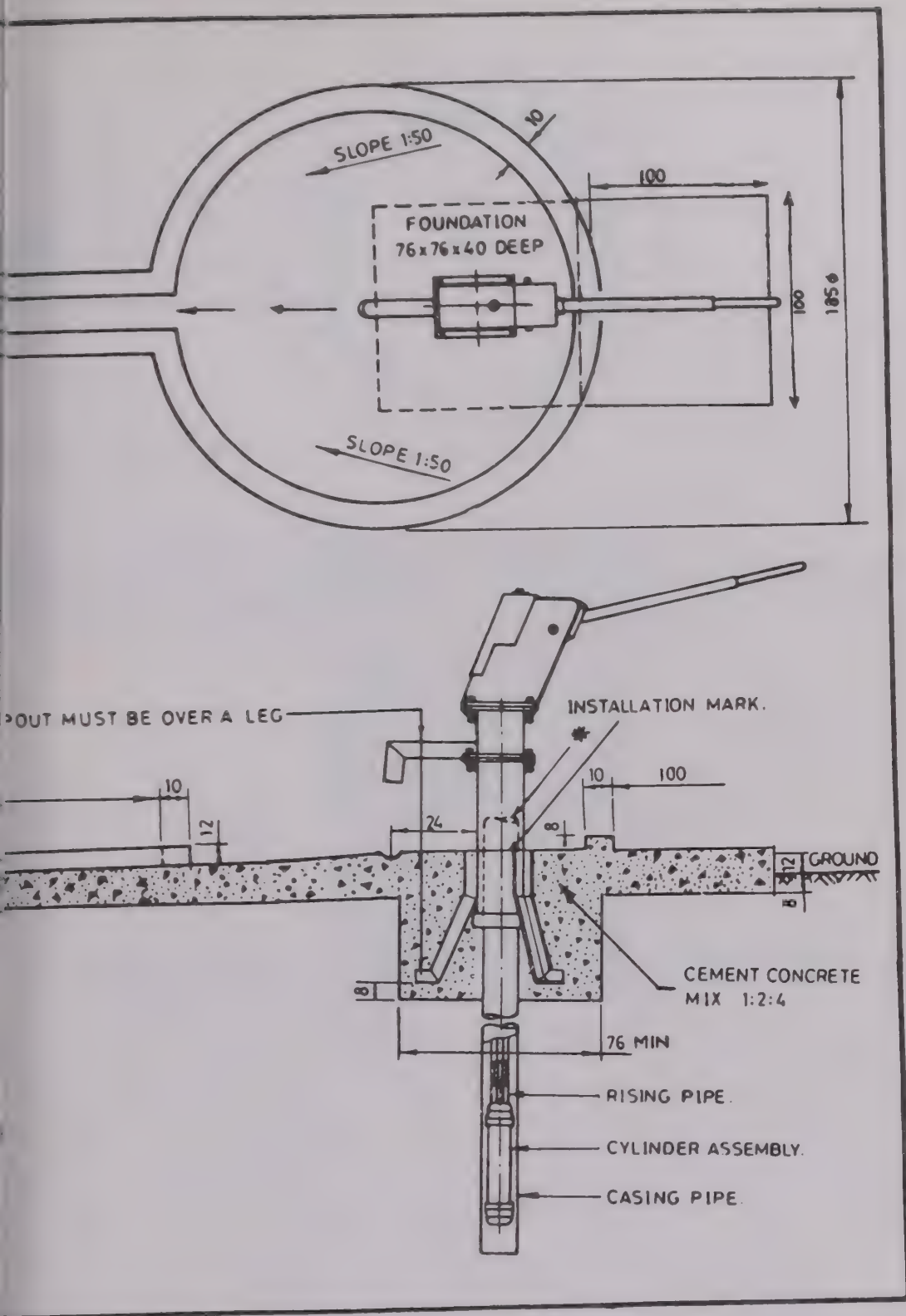
# PLATFORM FOR INDIA MARK-I DEEP WELL HAND PUMPS



All dimensions in m.m.

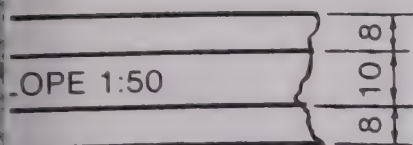
- \*This Pump Stand assembly is recommended for bore wells with Casing Pipe upto 5" (125 m.m.) N.B.
- For Casing Pipe of 6" (150 m.m.) N.B. use of Telescopic Stand Assembly as shown on page 65 is recommended.
- The free end of the Casing Pipe should be above the installation mark.





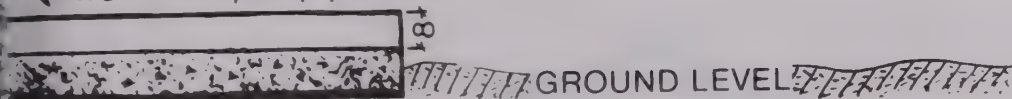






← from handpump platform,

← from handpump platform



# SOAKAGE PIT for HANDPUMPS

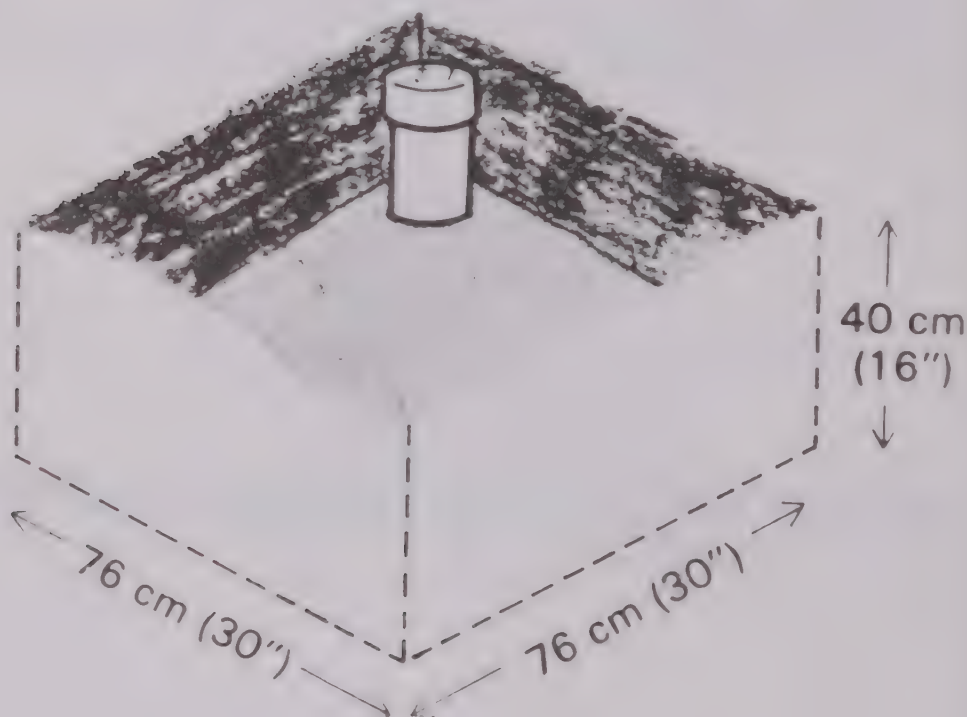
ALL UNITS IN CENTIMETRES

## Step

1

## DIG PIT FOR PUMP PEDESTAL

Remove casing pipe cover and measure depth of tube well & static water level and ensure that it is free from obstructions



Cover casing pipe.

Dig a square pit 76 cm (30") by 76 cm (30") around casing pipe and 40 cm (16") deep

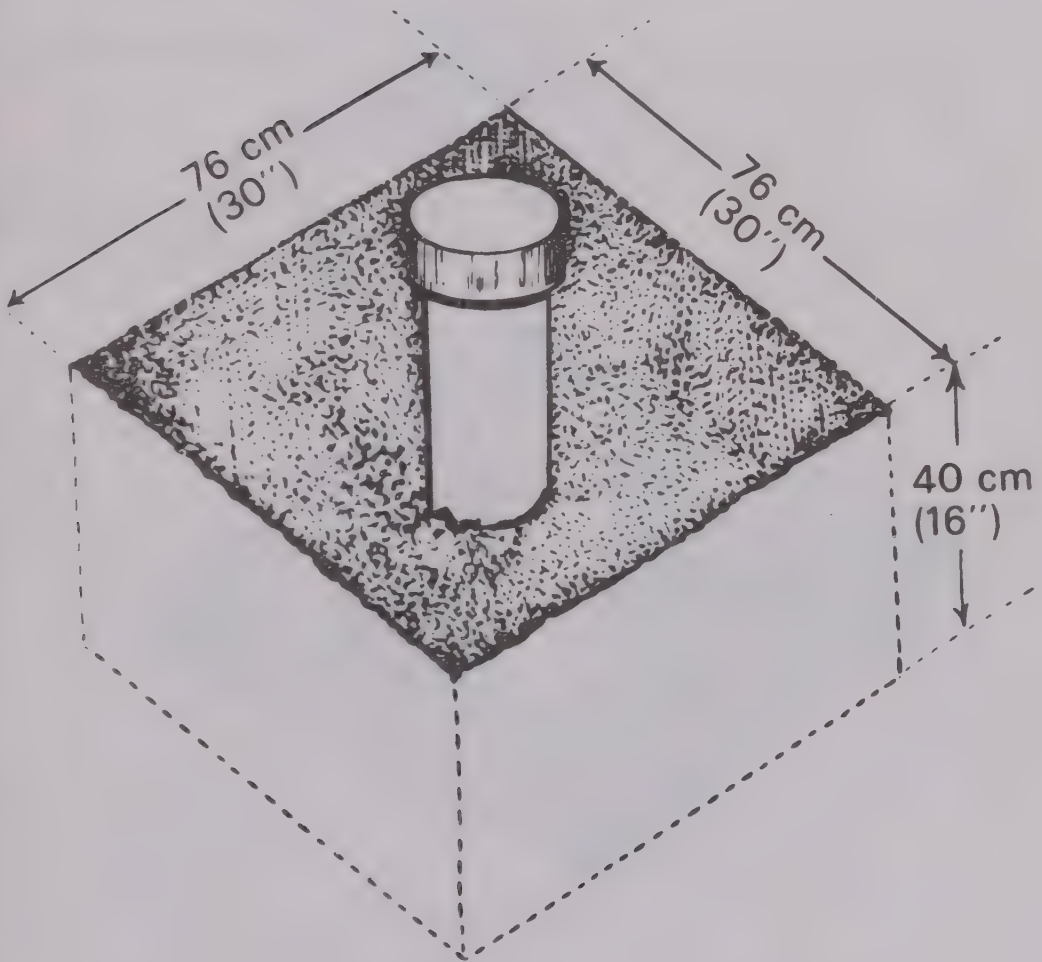


Step

2

## CHLORINATE TUBEWELL

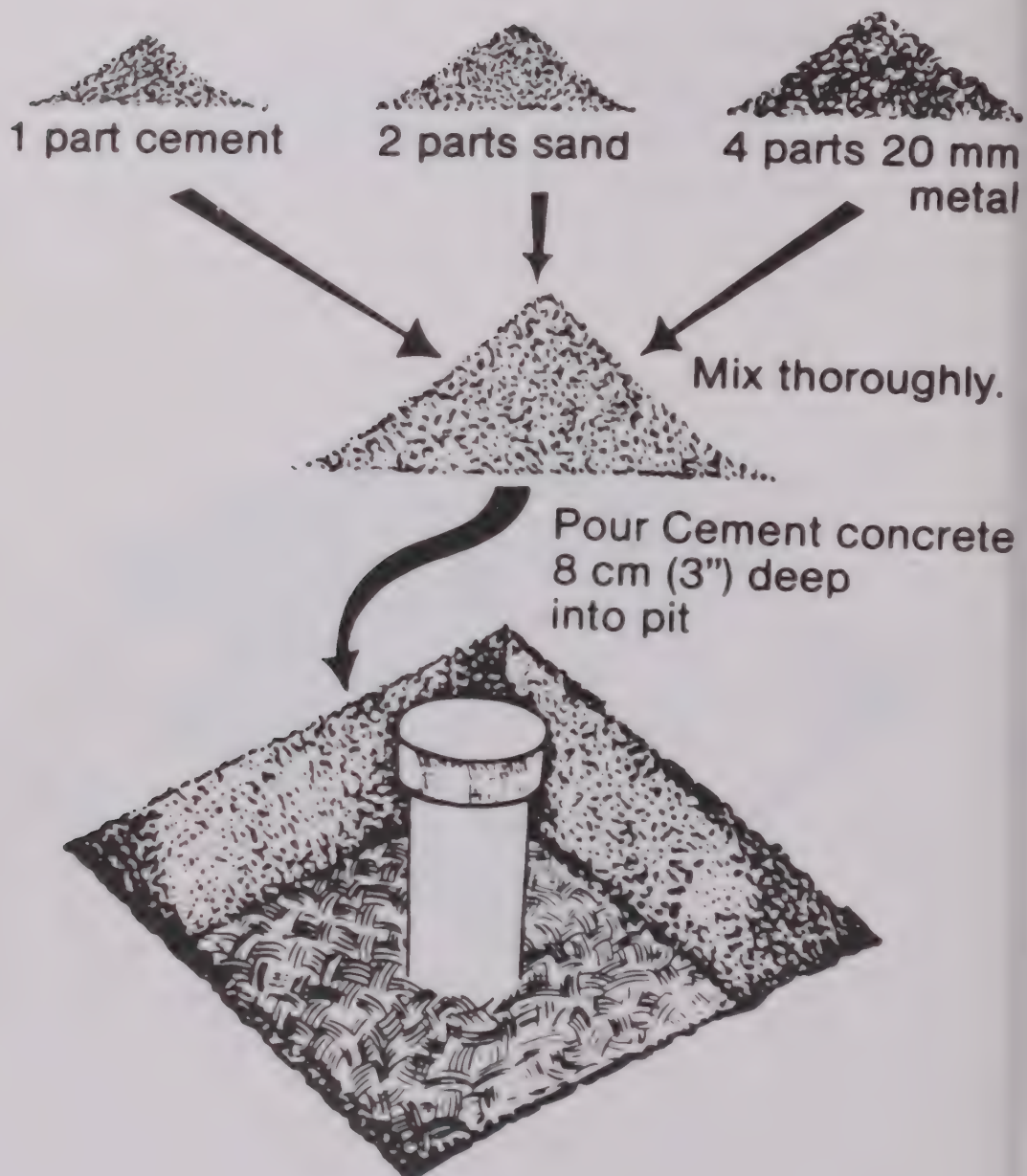
Mix 300 gms of Bleaching Powder in a bucket of water and pour into the tube well for chlorination. Cover casing pipe.



Step

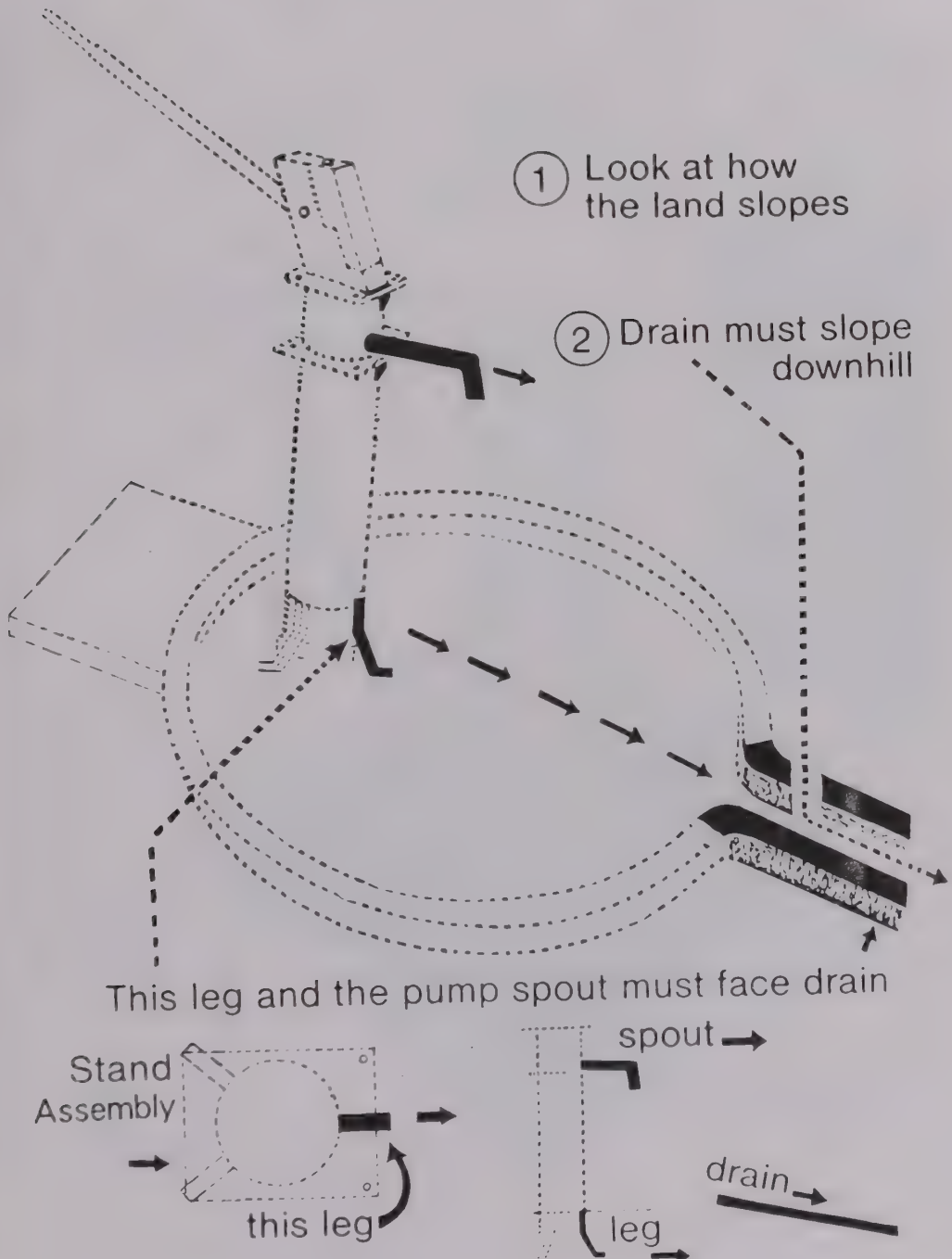
3

## PREPARE CEMENT CONCRETE MIX





# DECIDE NOW WHERE YOU WILL MAKE THE DRAIN

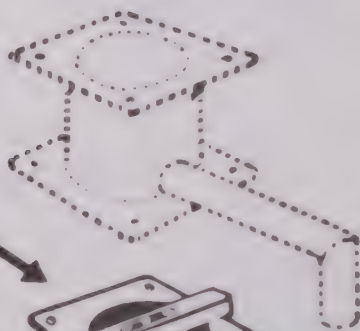


1

Remove cover of casing pipe

2

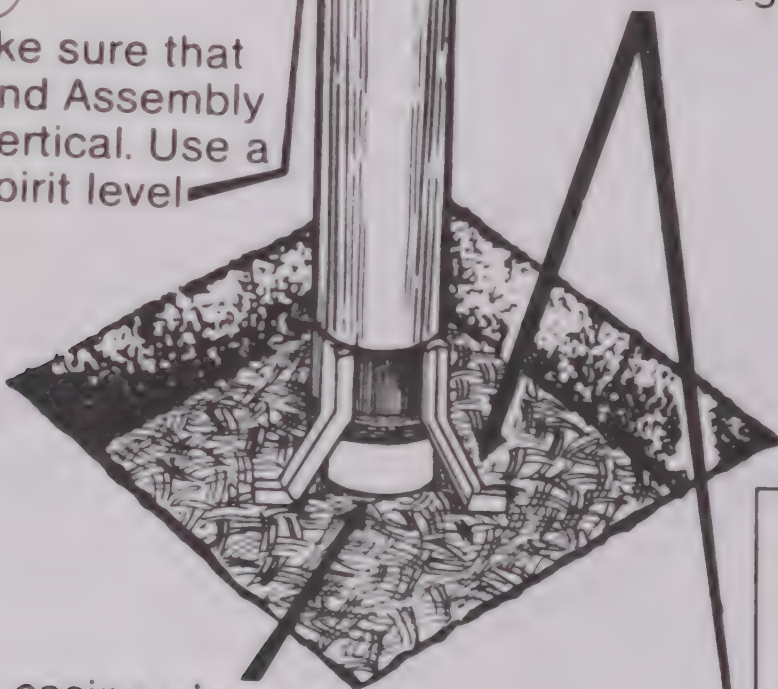
Place  
Stand  
Assembly  
over  
casing pipe  
so that.....



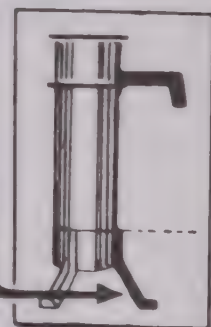
....when you  
fit water tank  
spout will be  
over  
this leg

3

Make sure that  
Stand Assembly  
is vertical. Use a  
spirit level



casing pipe



Step

6

1

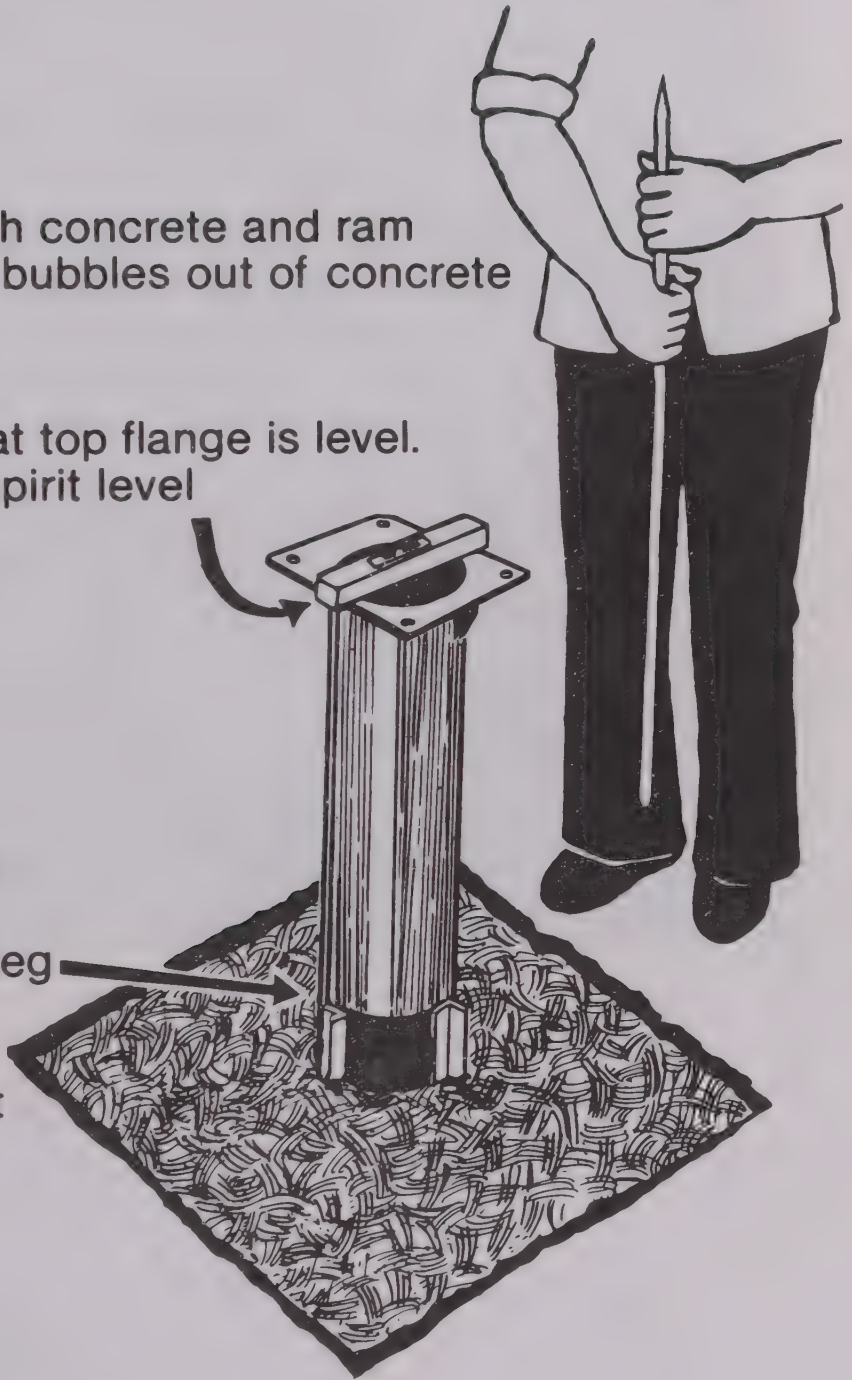
Fill pit with concrete and ram to get air bubbles out of concrete

2

Check that top flange is level.  
Use the spirit level

3

Construct  
platform  
to top of leg  
while  
concrete  
is still wet







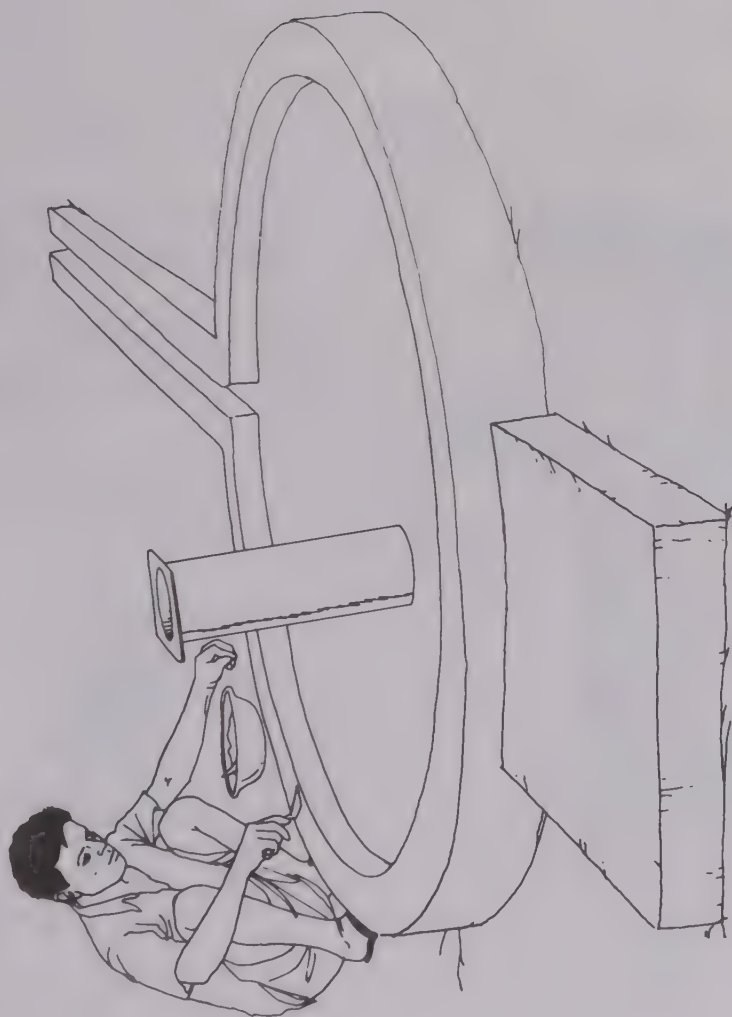
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MILD STEEL PLATFORM SHUTTERING UNIT  
FOR INDIA MARK-II DEEP WELL HAND PUMP.

---

## Step

7



Construct platform and drain  
Use plan on pages 6 and 7.  
Approximate Material Requirement  
for construction of one Platform

(a) CEMENT — 6 Bags

(b) SAND —  $0.4 \text{ Om}^3$

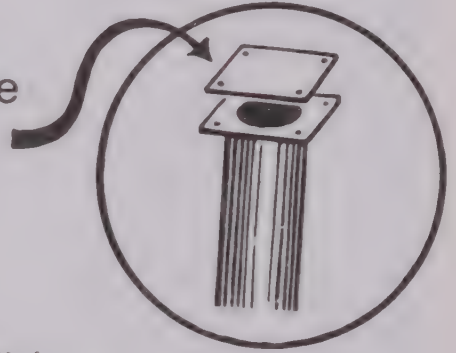
(c) Metal (20 mm Size)— $0.80 \text{ m}^3$

## Step

8

Cover Stand Assembly so that children can't put stones in the well

—if you have a cover plate



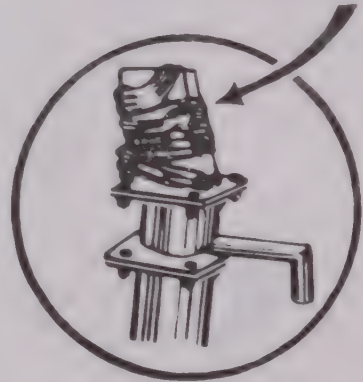
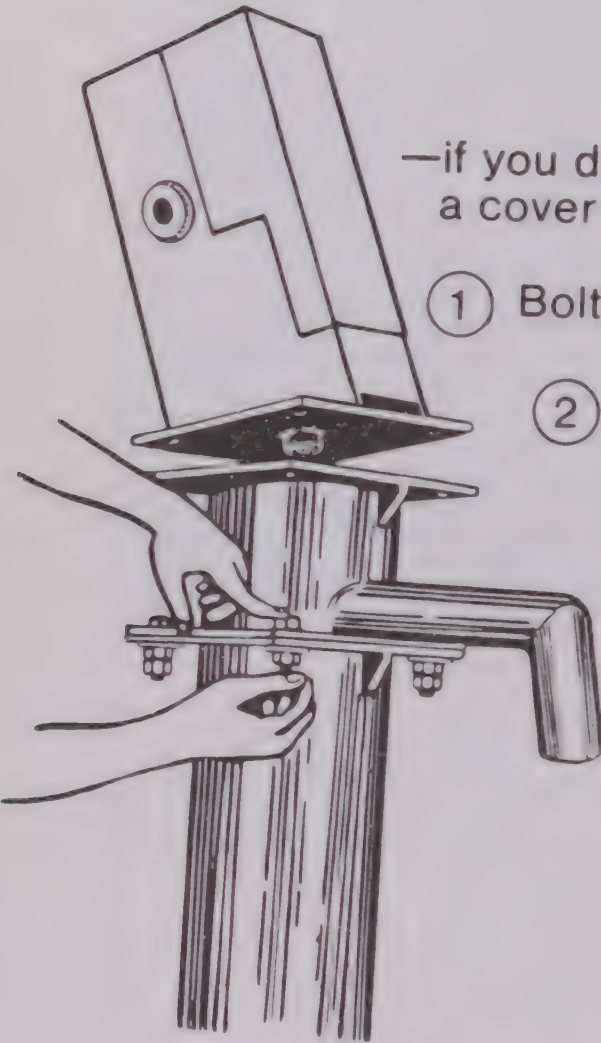
—if you don't have a cover plate.....

① Bolt on water tank

② Remove handle assembly from head assembly

③ Bolt on head assembly

④ Wrap cloth around head





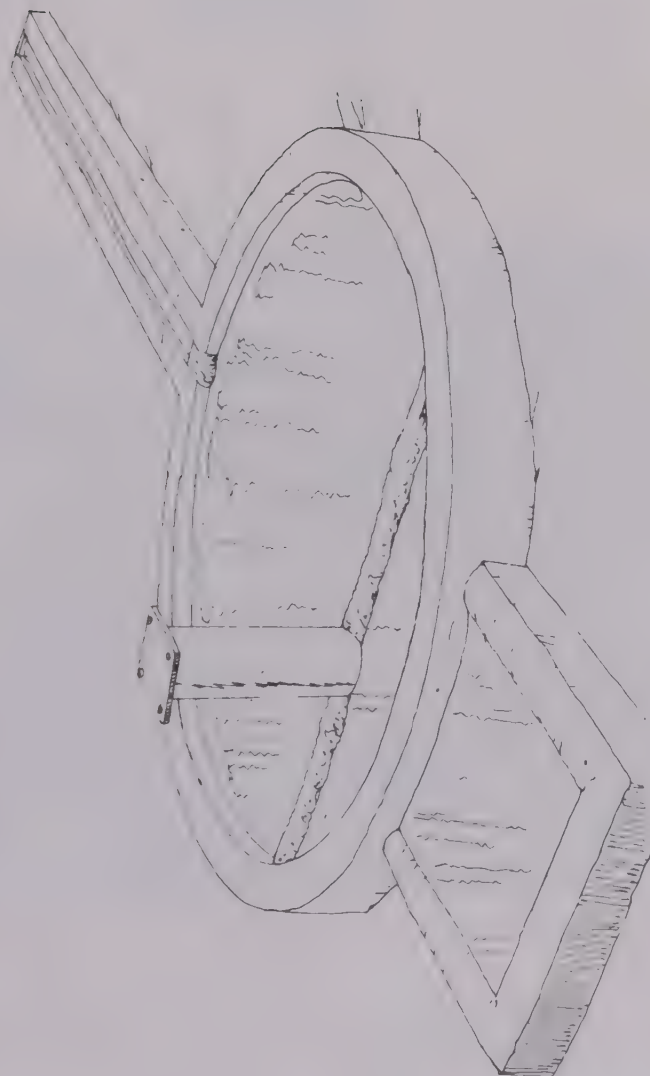
Step

9

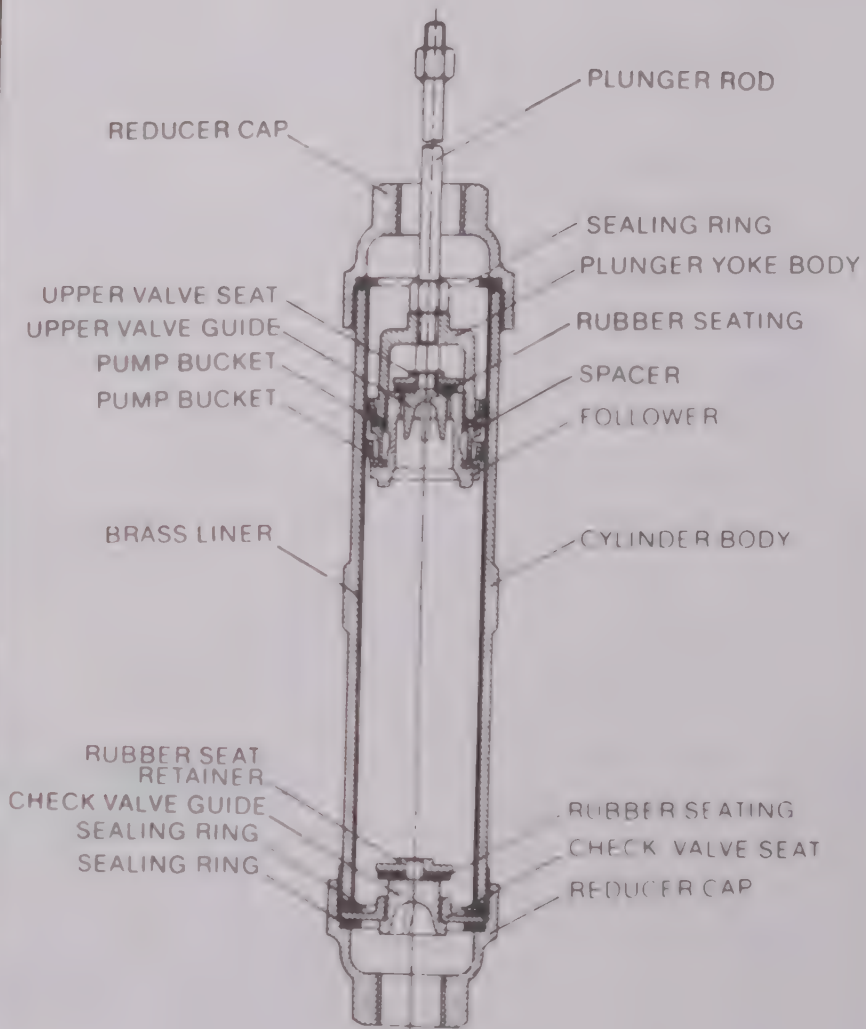
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**ALLOW CONCRETE TO SET FOR 7 DAYS**

---



To cure concrete, block drain  
and fill platform with water.  
Ask villagers to keep away  
from installation



SECTIONAL DETAILS  
OF  
CYLINDER ASSEMBLY

Step

10

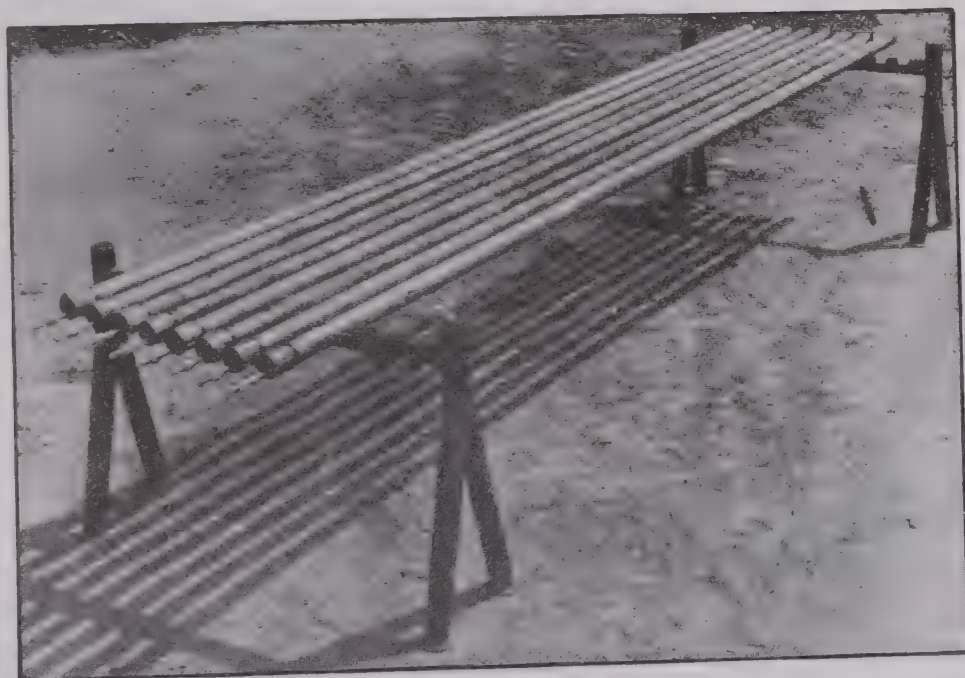
## SEVEN DAYS LATER

Lay out pipes and connecting rods.

Check that pipes and rods are threaded properly

Check that all threads are good and clean

Ensure that all pipes have socket at one end



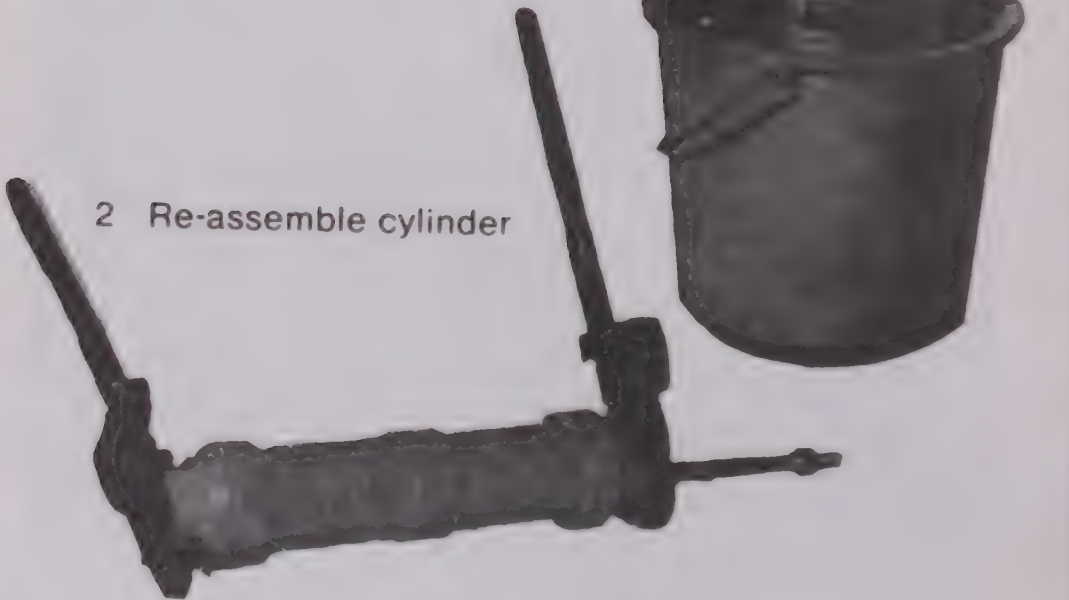
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21  
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Bangalore-560034  
India



## CHECK CYLINDER OPERATION

- 3 Test cylinder in a bucket of water.  
If Check valve Assembly leaks  
replace it.



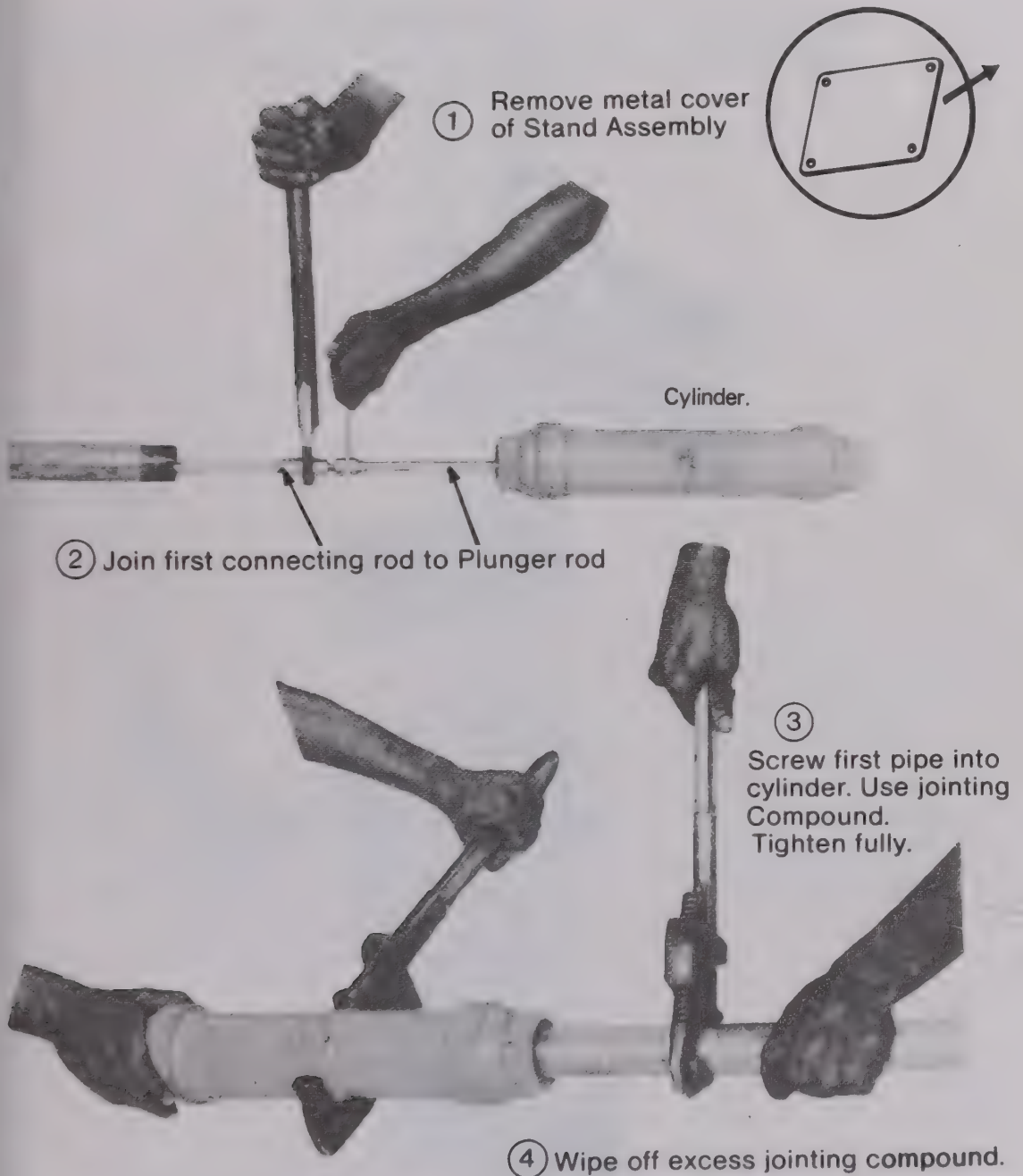
- 2 Re-assemble cylinder

- 1.....Open Cylinder and check  
that piston Assembly and  
check valve Assembly are  
tight and properly assembled

Step

12

## FIX CYLINDER TO FIRST ROD AND PIPE



## Step

13

Cylinder should be installed at a minimum depth of 24 metres

Lower cylinder, first pipe and connecting rod into tube well.

Never install a cylinder less than 6 Metres from the bottom of the tube well.





Step

14

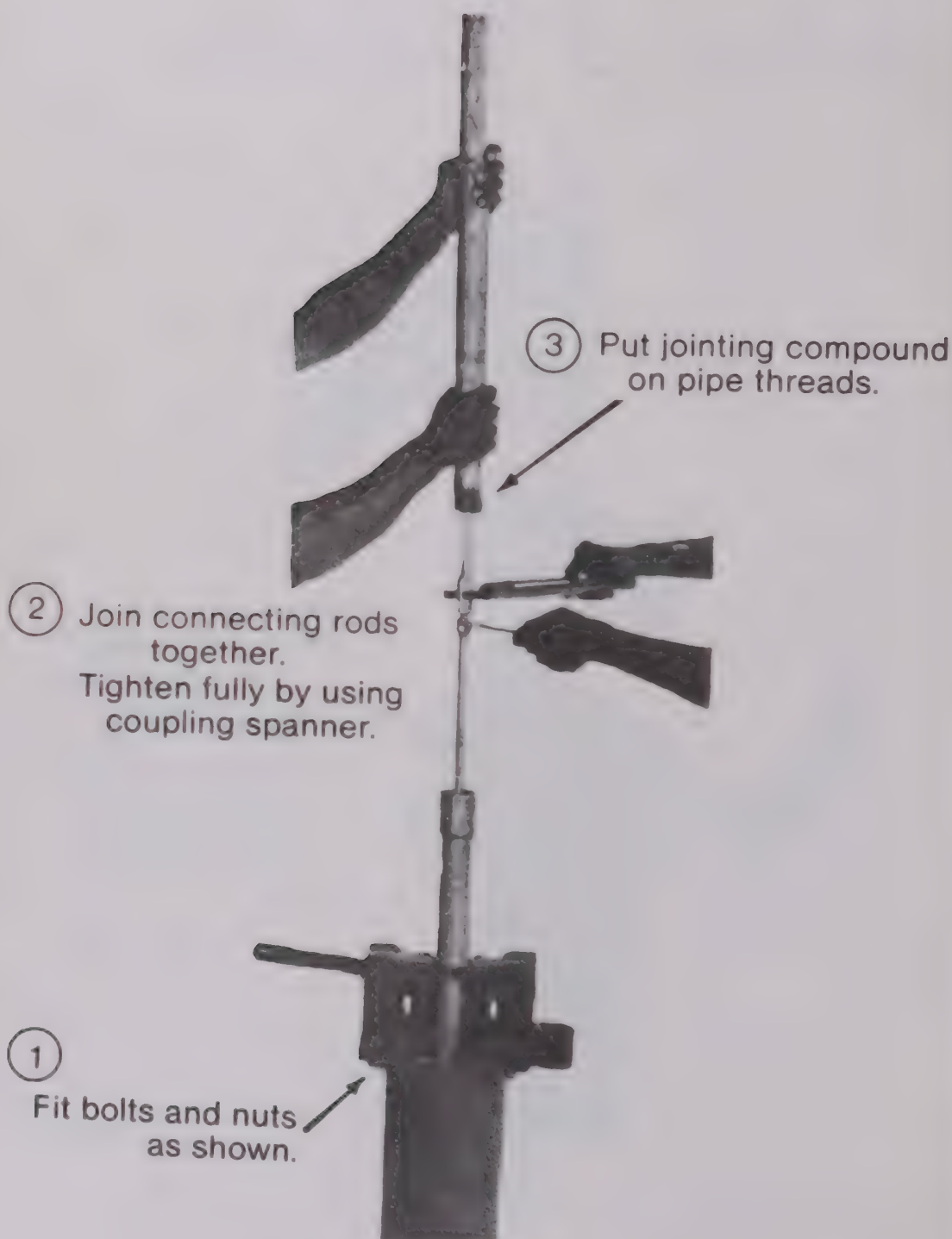
connecting rod

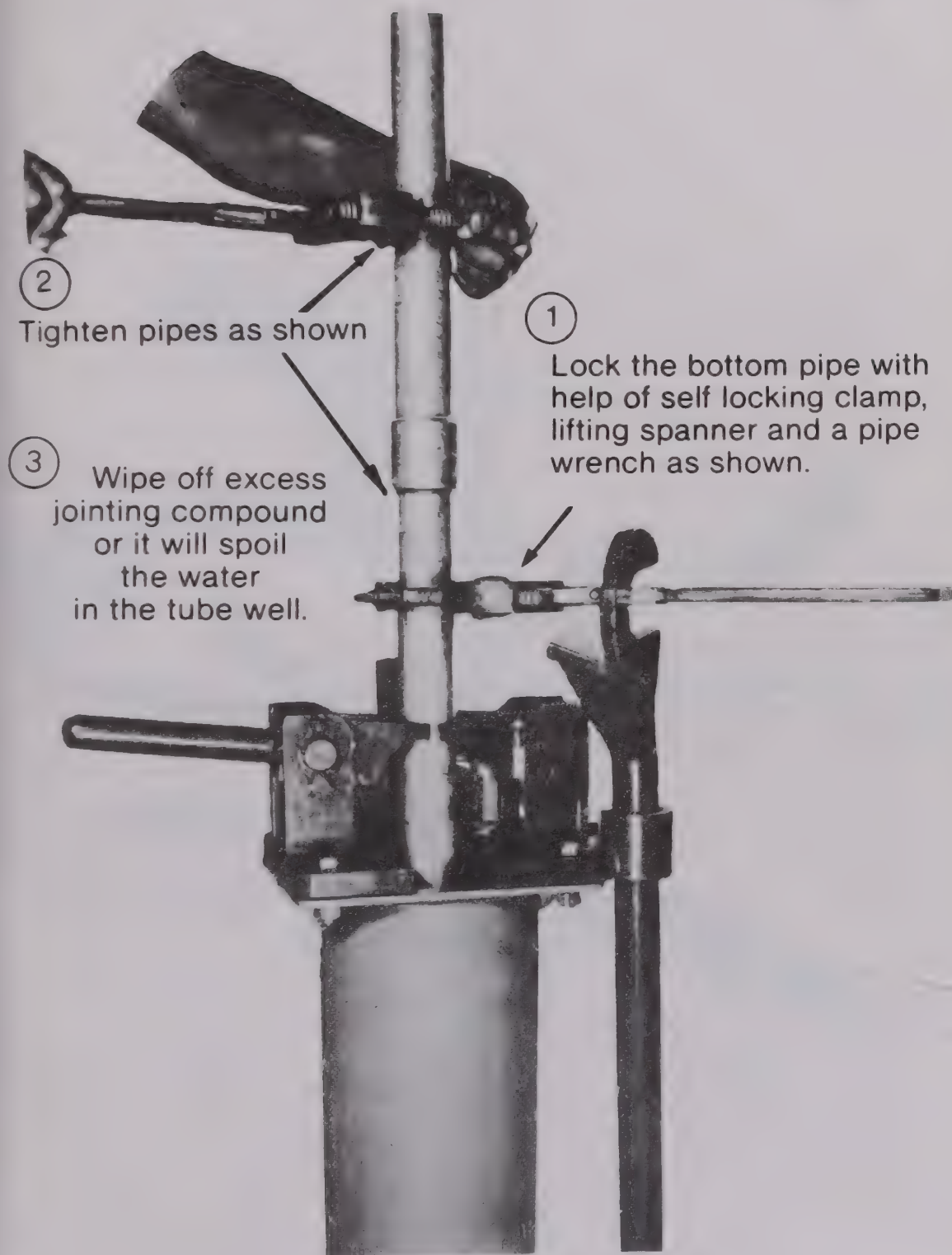
riser pipe

Insert the  
self locking clamp  
to clamp the riser  
pipe as shown.



# FIX SUCCESSIVE PIPE AND RODS

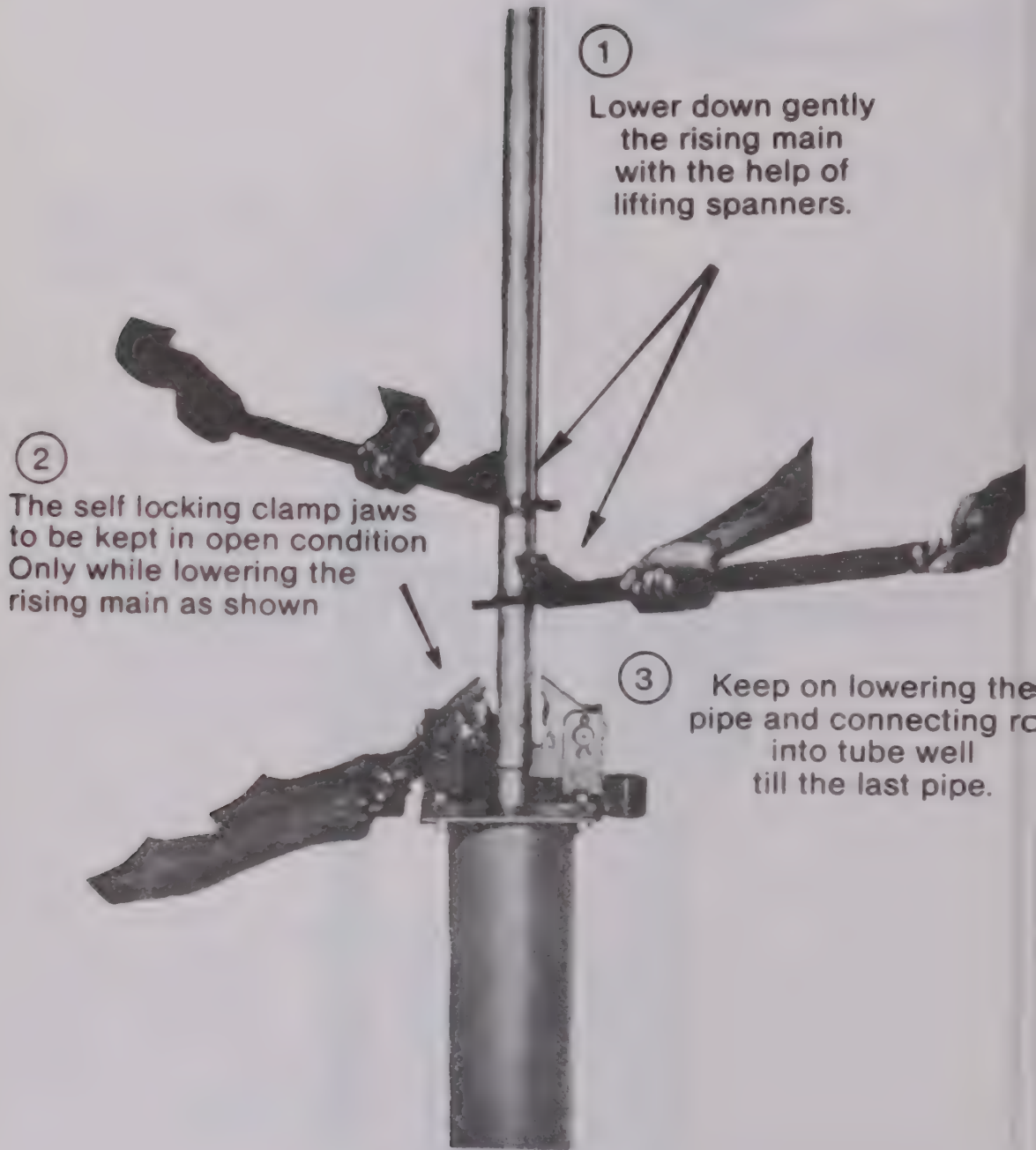






## Step

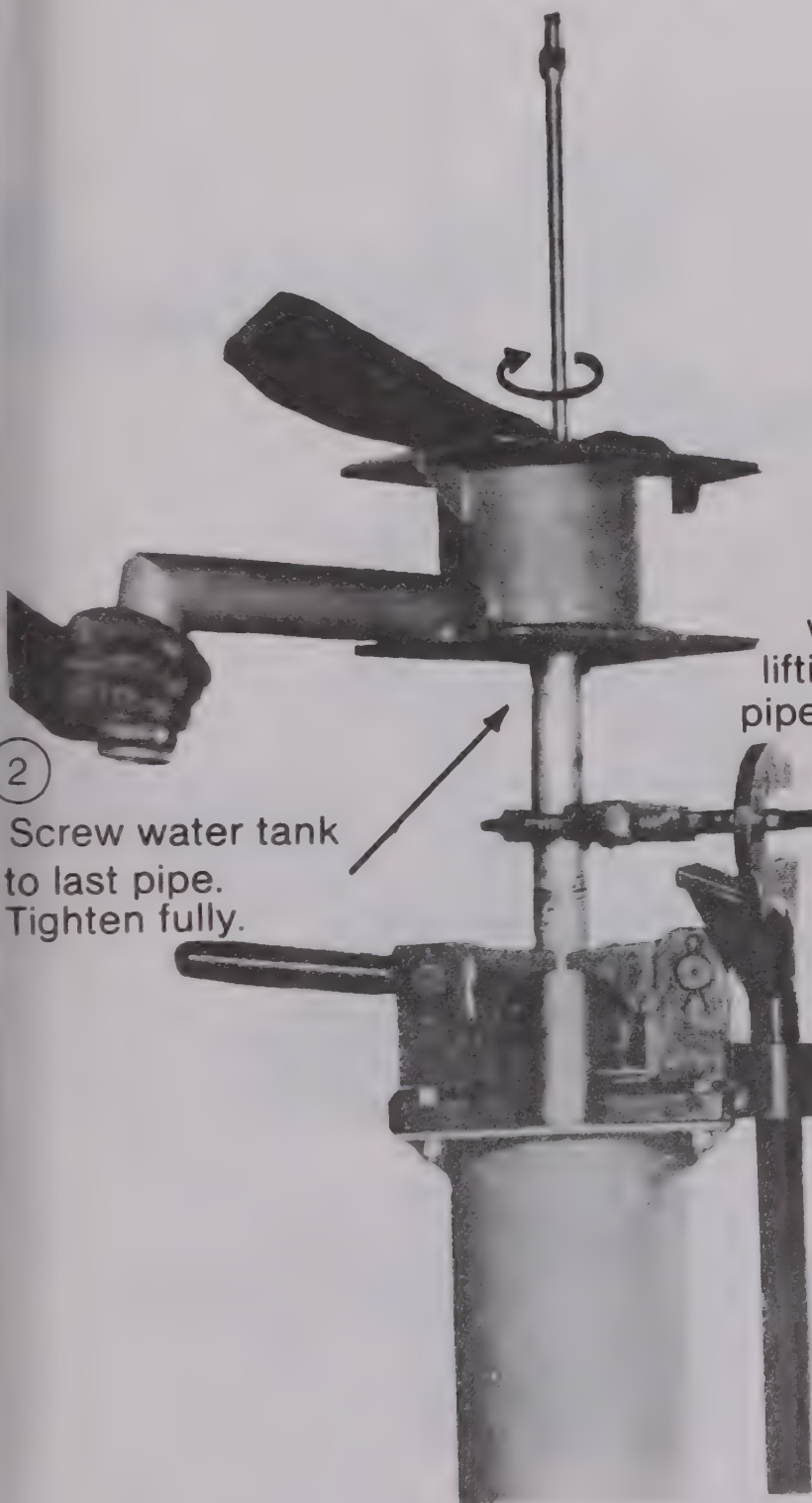
17



Step

18

## FIX WATER TANK TO LAST PIPE



1

Lock the pipe  
with the help of  
lifting spanner and a  
pipe wrench as shown.

2

Screw water tank  
to last pipe.  
Tighten fully.

Cylinder should be  
installed at a  
minimum depth of  
24 Metres for  
maximum efficiency

## Step

19

- ① Screw tank pipe lifter onto Water tank coupling.

②

- Remove bolts and nuts holding the self locking clamp.

③

- Withdraw self locking clamp as shown.

④

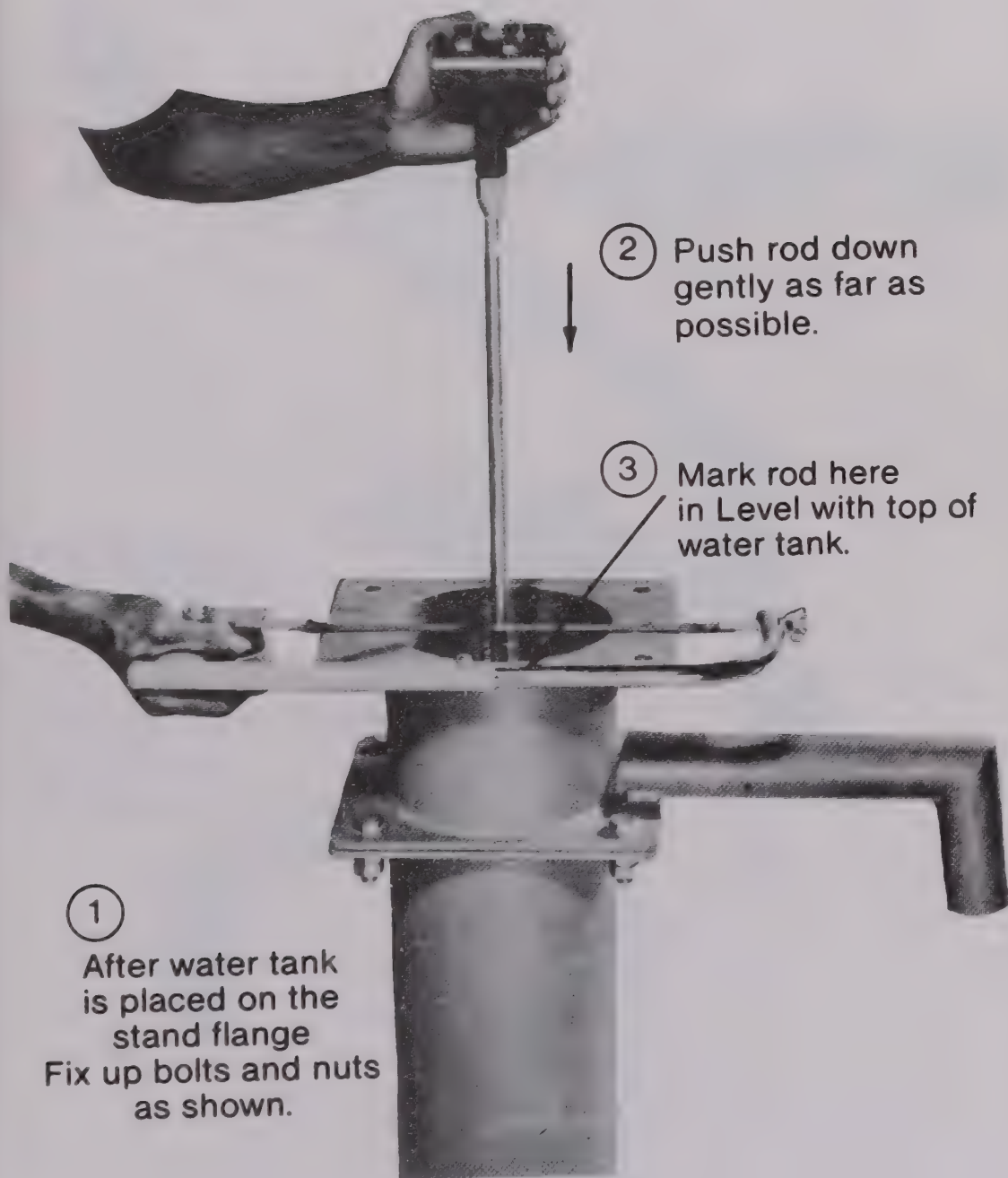
- Use lifting spanners to lower down the water tank gently as shown till it is placed on stand flange



# FIX WATER TANK ON STAND ASSEMBLY

Step

20

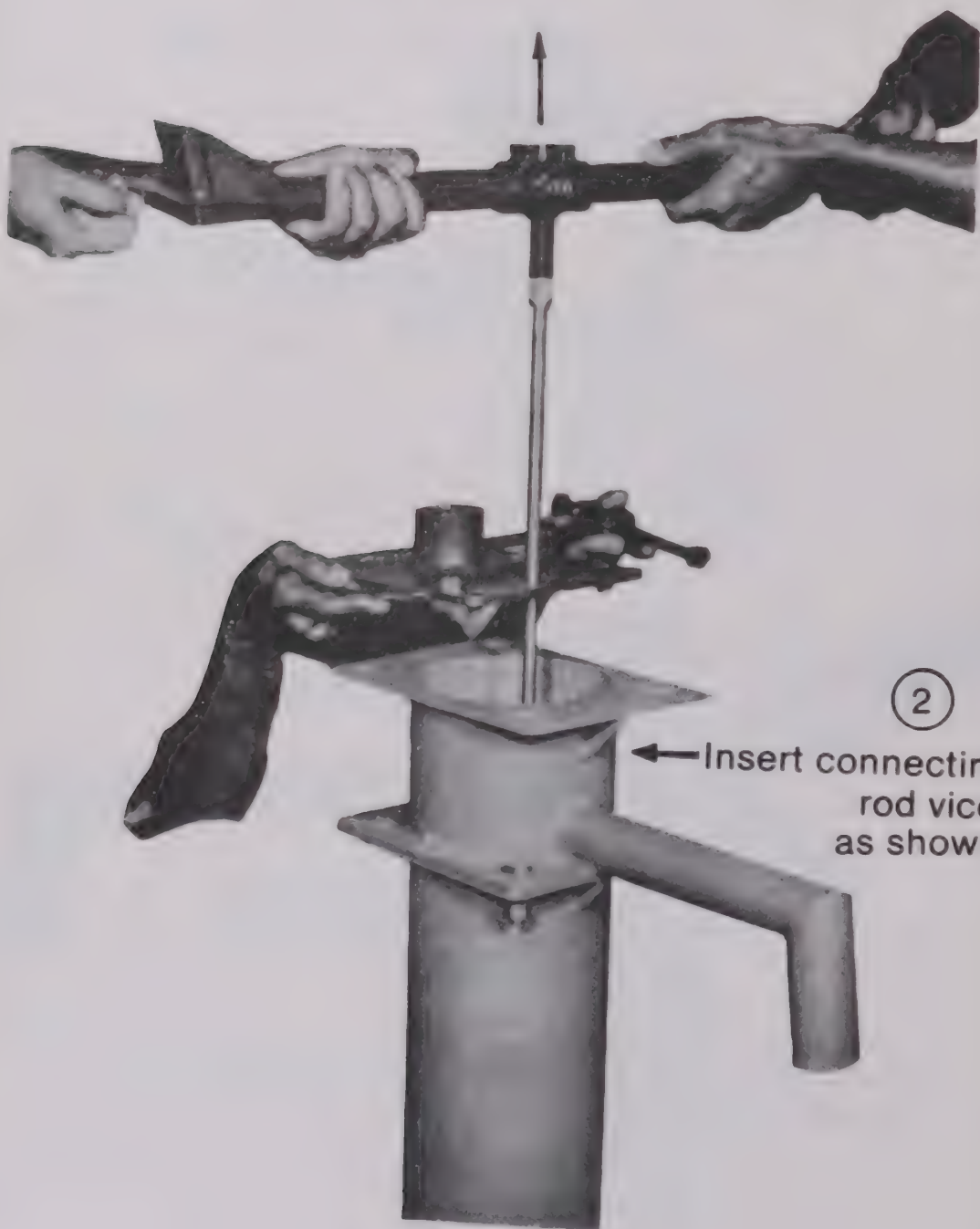


## Step

21

1

Lift rod as far as possible with help of connecting rod lifter as shown.



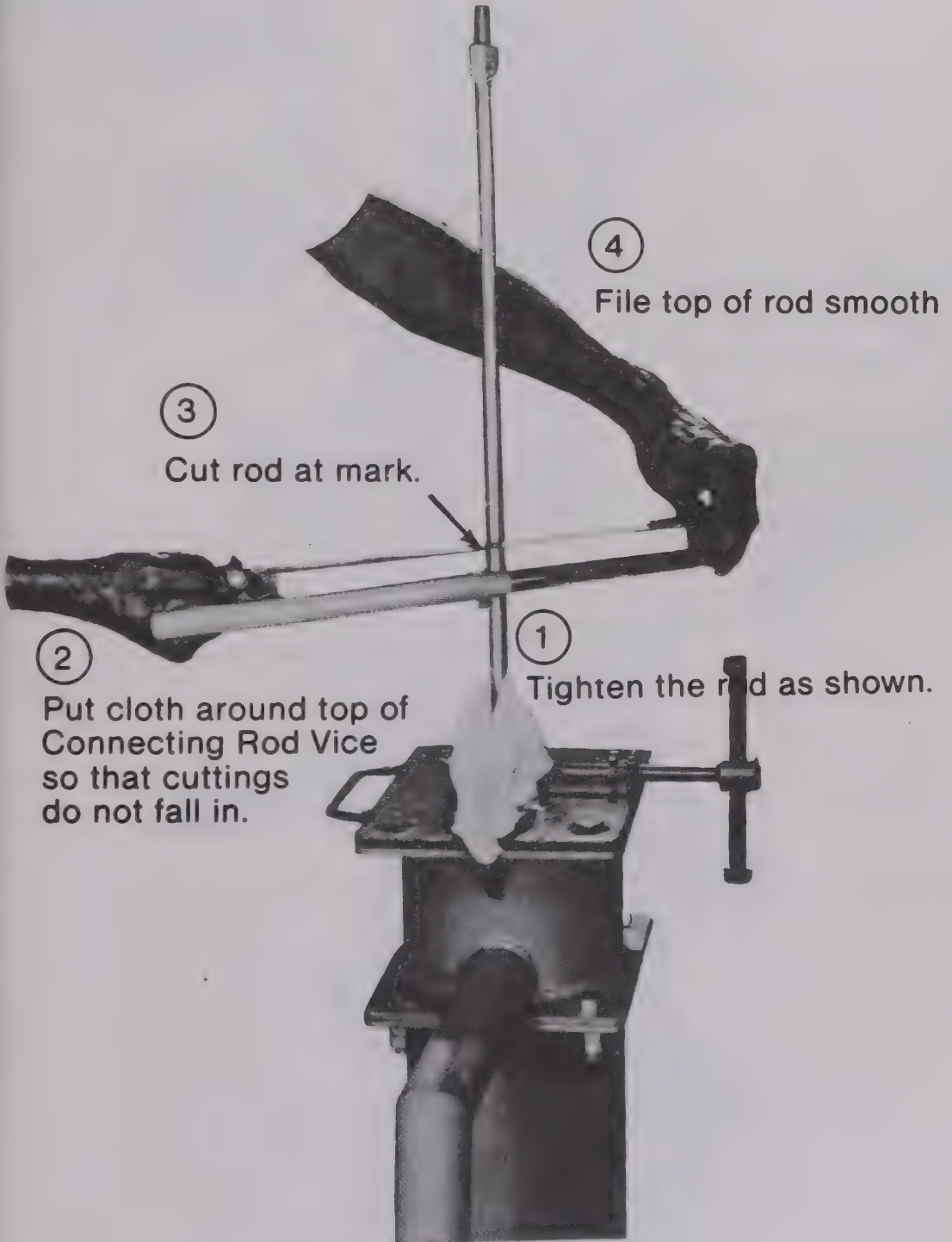
2

Insert connecting rod vice as shown.

Step

(22)

## SET PISTON STROKE LENGTH

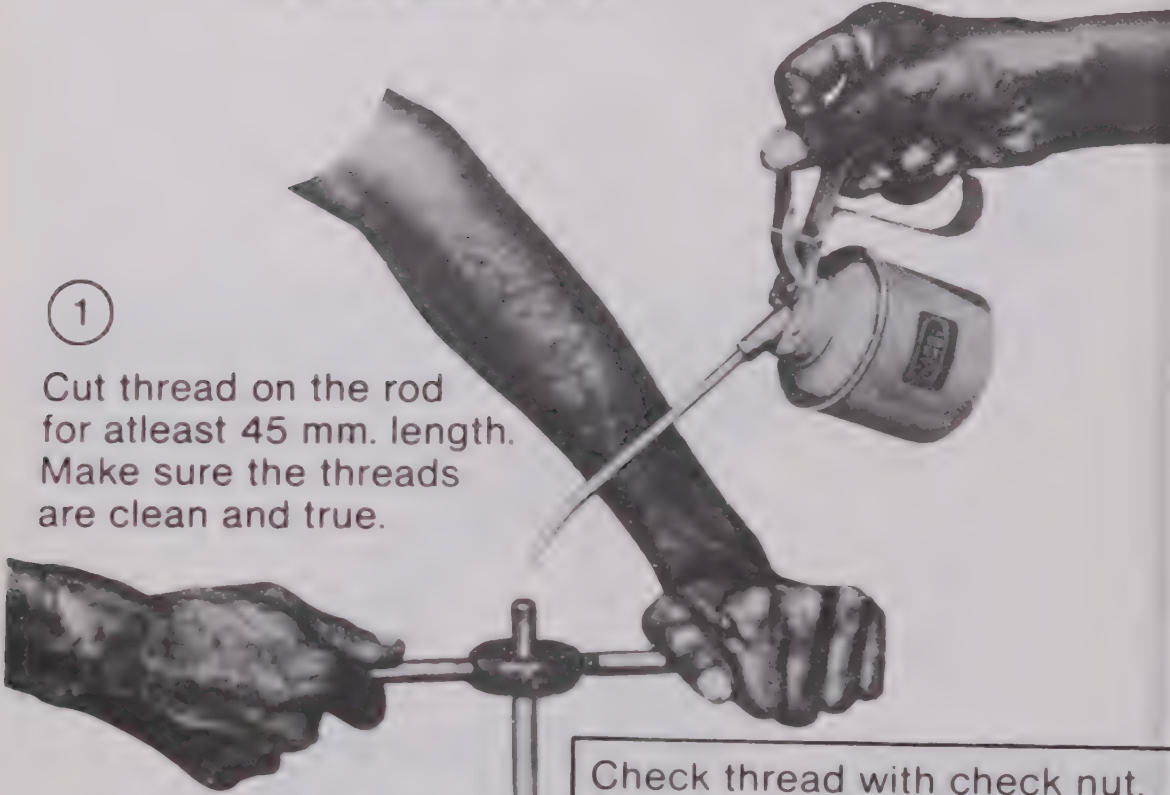




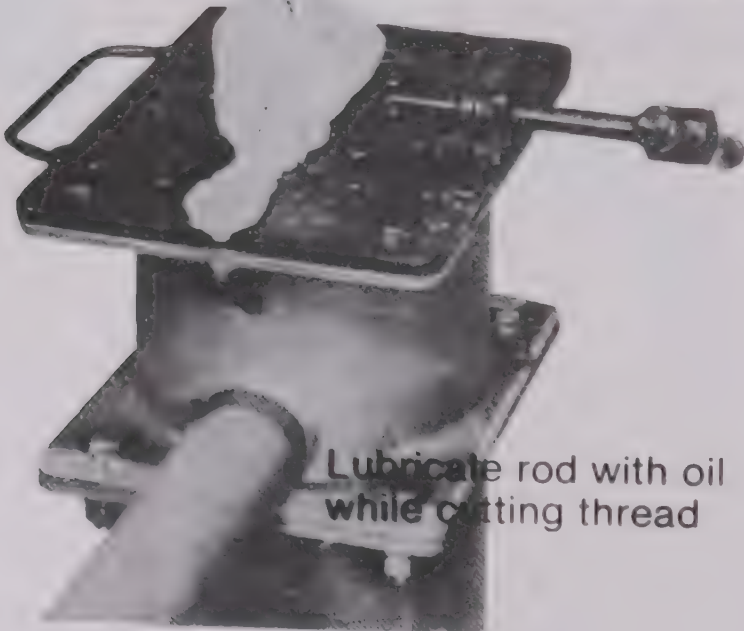
## CUT THREAD FOR CHAIN CONNECTION

1

Cut thread on the rod for atleast 45 mm. length. Make sure the threads are clean and true.



Check thread with check nut. You must be able to screw the nut all the way down by hand.

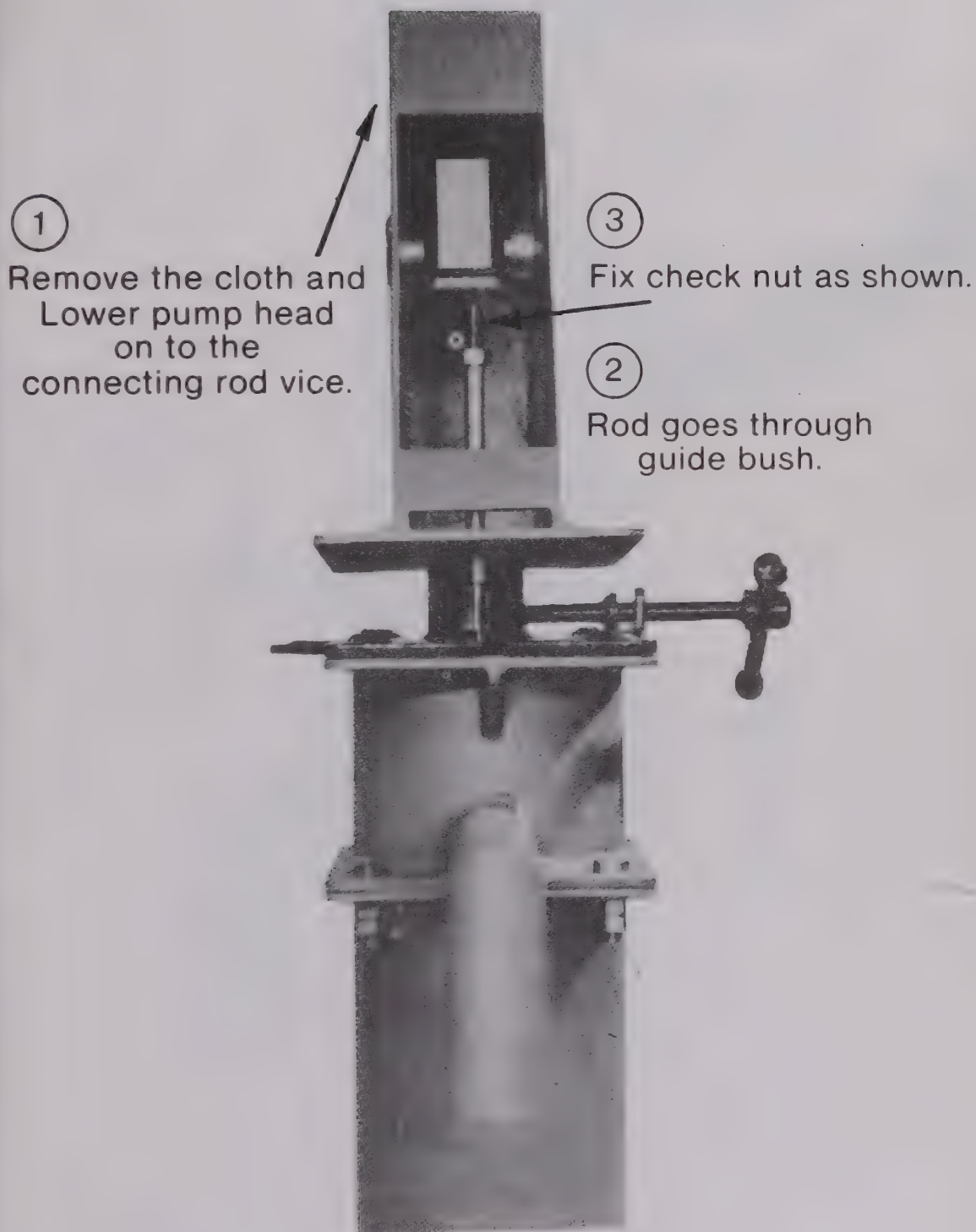


Lubricate rod with oil while cutting thread

## FIX HEAD ASSEMBLY

Step

24



## THREAD CHAIN TO CONNECTING ROD

Step

25

①

Screw chain on to  
rod upto two  
threads by hand.

②

Keep the chain  
as shown.

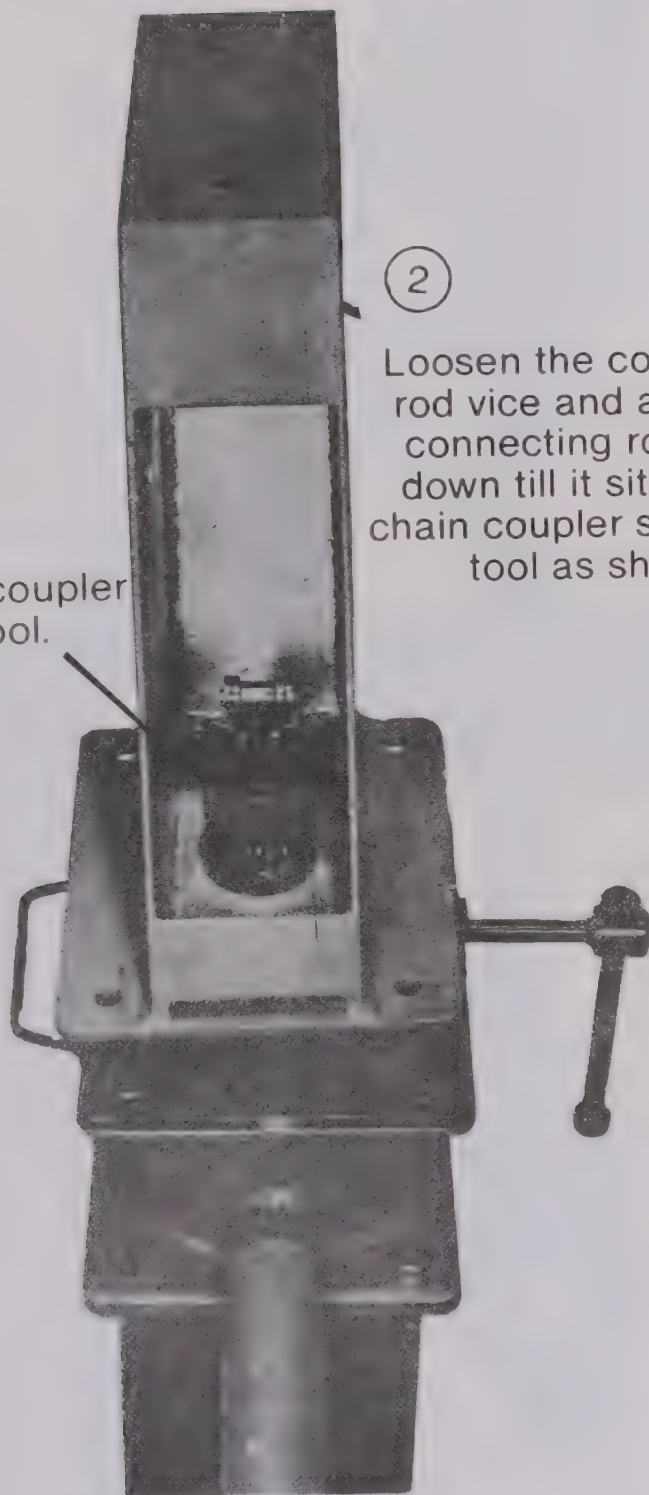
③

Rotate the head  
as shown till the  
chain coupler gets  
tightened fully.



## Step

26



1

Insert the chain coupler supporting tool.

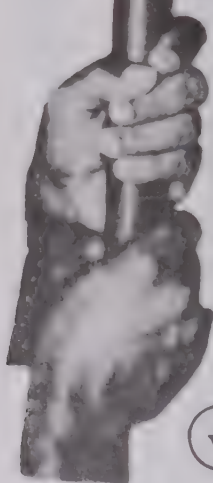
2

Loosen the connecting rod vice and allow the connecting rod to go down till it sits on the chain coupler supporting tool as shown.

# PLACE HEAD ON WATER TANK

Step

27



1

Insert lifting spanner as shown and lift the pump head gently.



2

Withdraw connecting rod vice as shown.



3

Lower the head till it sits on water tank.

Step

28

## FIX HANDLE

3

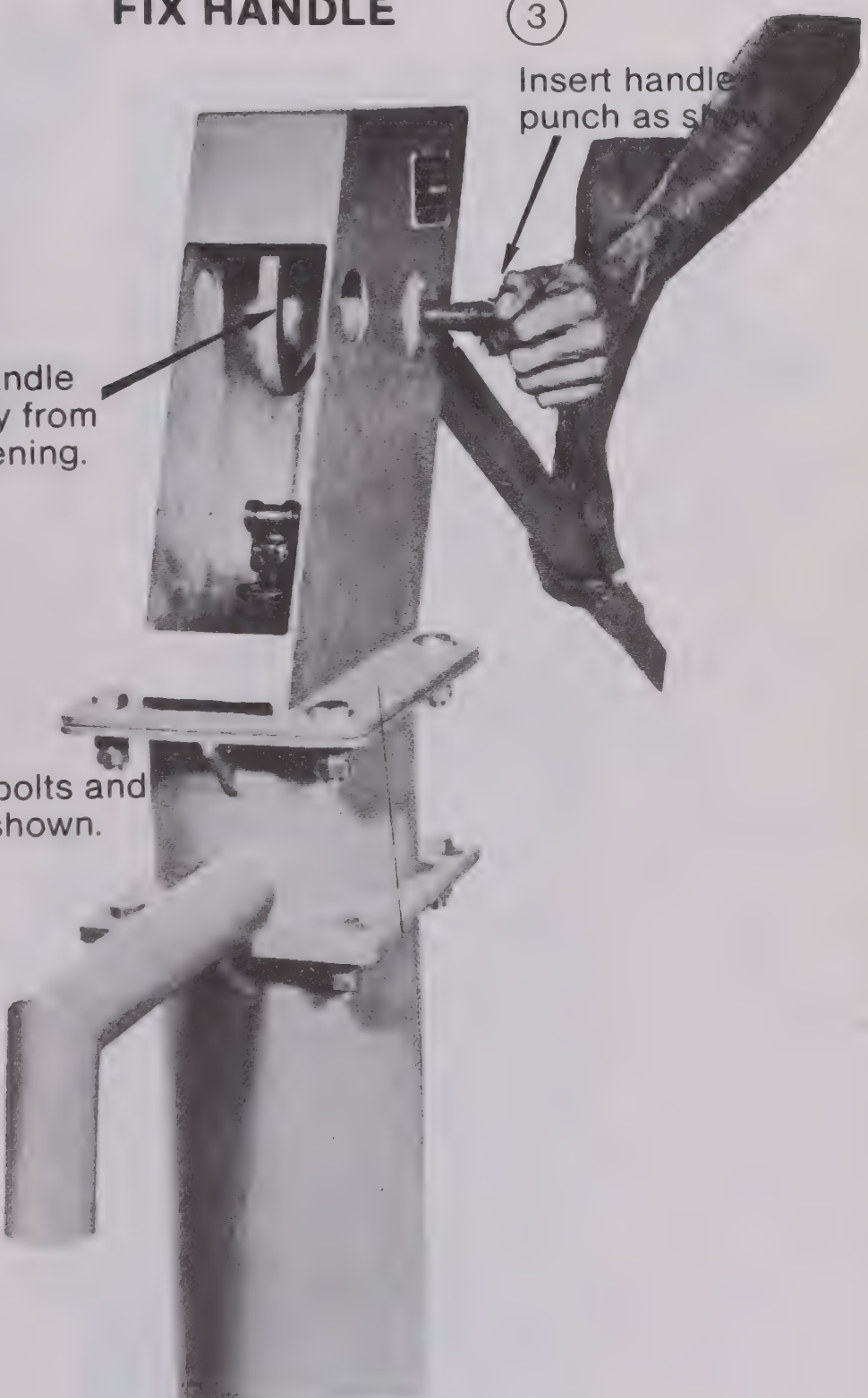
Insert handle  
punch as show

2

Insert handle  
assembly from  
front opening.

1

Tighten all bolts and  
nuts as shown.





Step

(29)



① Insert the handle axle as shown. Tap gently.

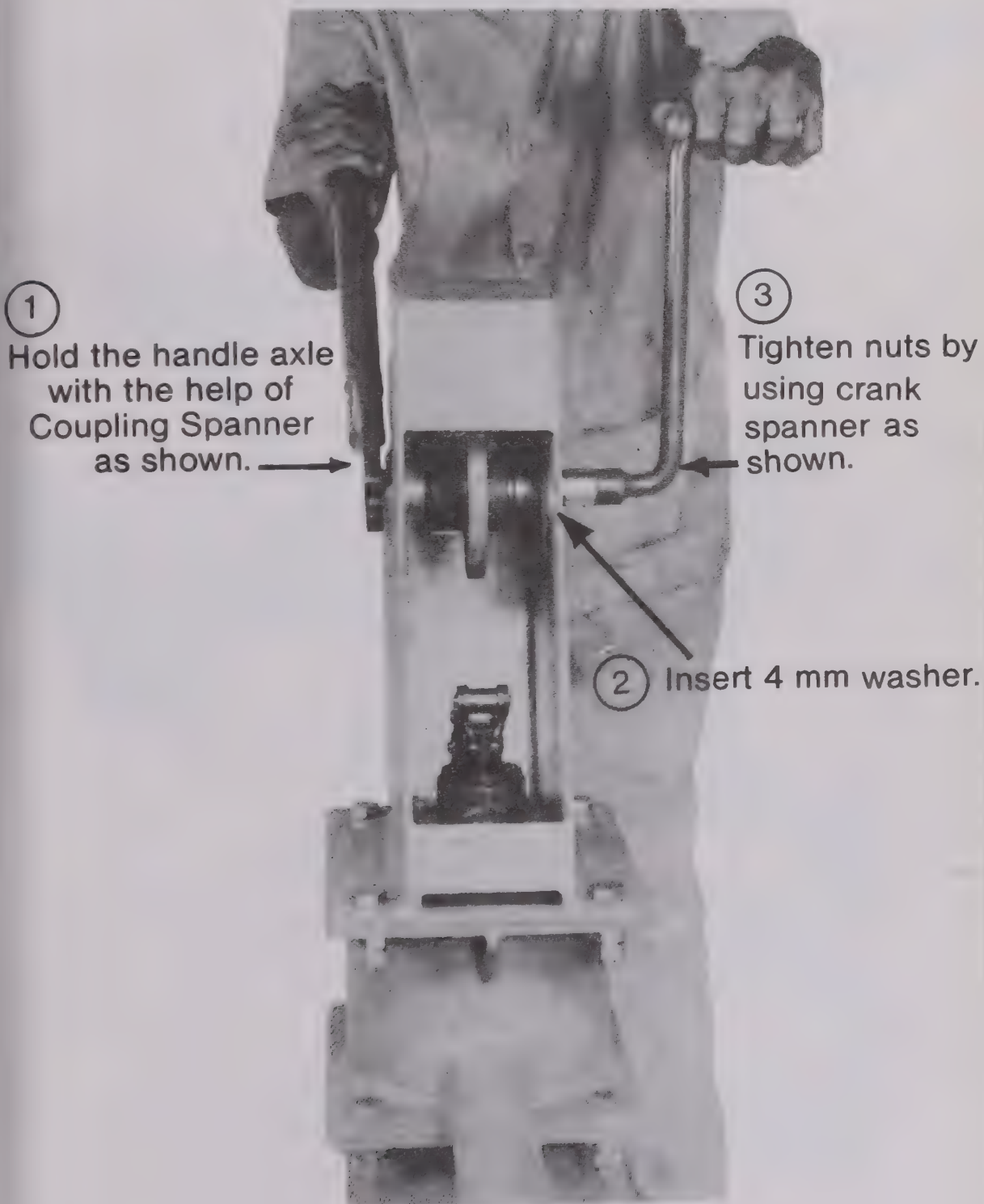
② Drive the handle axle till the threaded portion comes out.

③ Remove handle axle punch.



## Step

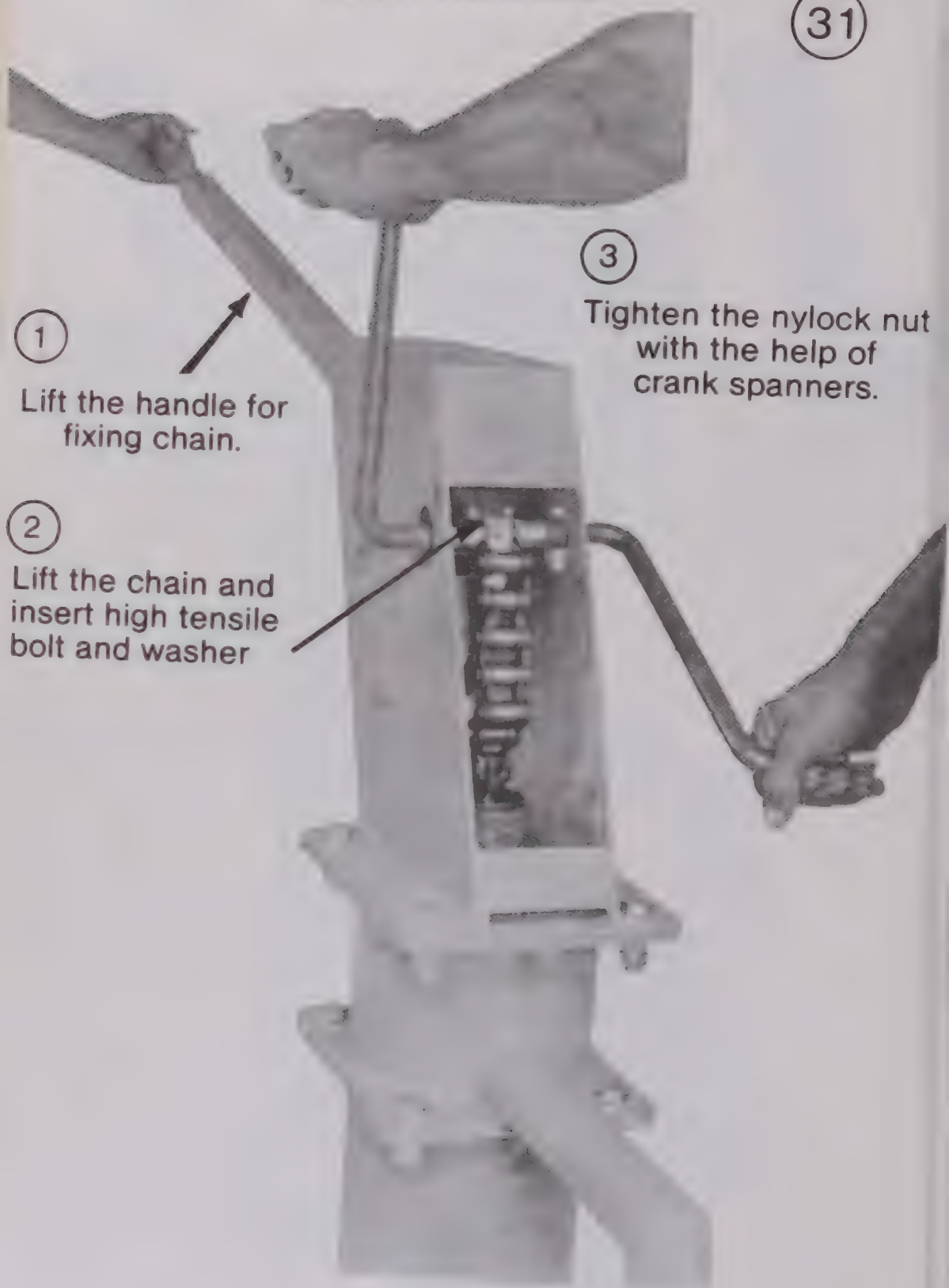
30



## CONNECT CHAIN WITH HANDLE

Step

31



## LUBRICATE CHAIN

Step

32

3

Lift handle up and apply  
\*Graphite Grease on Chain

1

Lower down handle and  
Remove chain coupler  
supporting tool.

2

Tighten the check nut  
against the  
chain coupler

\*If graphite grease is not available,  
use multipurpose grease.



## Now make Sure that....



When you pump, the handle touches the top stop and bottom stop of Bracket. If it does not, then remove head and check the setting of the top connecting rod. Refer Page 31.



Connecting rod moves up and down freely in guide bush. If it does not, then the rod must have got bent while threading.



You have threaded chain coupling fully on to connecting rod, and you have tightened the lock nut fully.



You have tightened axle nut and lock nut fully and the handle axle is firmly retained.



You have tightened chain anchor bolt and nyloc nut fully.



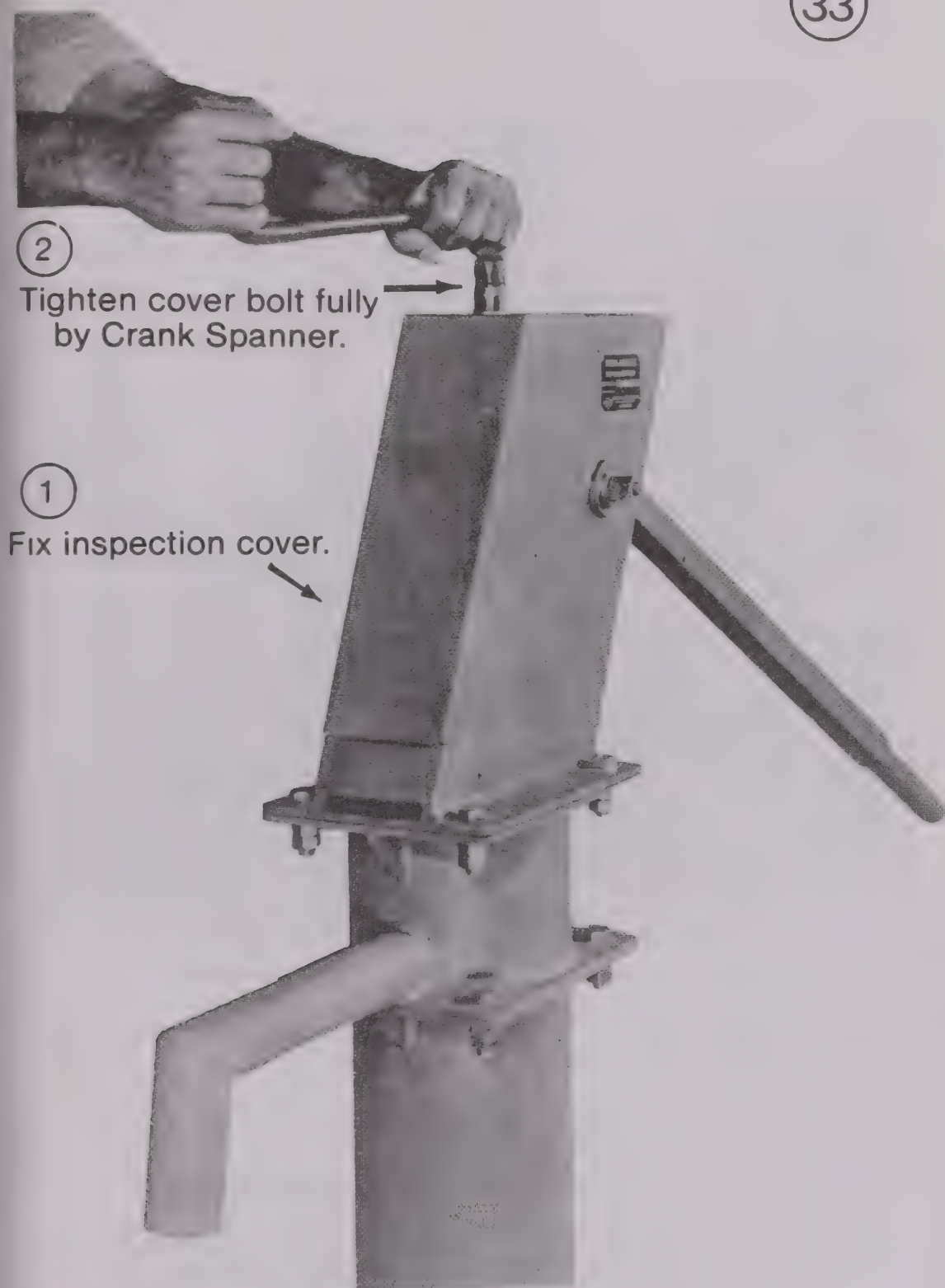
All the flange bolts & nuts are tight, and you have also tightened the lock nuts fully.



You have left nothing inside the head.

Step

33





Operate the pump handle one hundred times to get clean water.

Check the water. Is it free from oil, jointing compound, dirt?

If water is not clean, pump 100 times again.

The water may taste strange to the villagers. Explain to them that it is good, safe water. They will soon get used to it

# FINAL CHECK LIST

**Before you leave, have you....**



Explained to the villagers about the importance of the hand-pump for their health ?



purged the tubewell ?



checked the quality and taste of the water ?



explained to the villagers that the water from hand-pump may taste different, or strange ? You must explain that they should still drink it, because this water is safe. They will get accustomed to the new taste soon.



given the villagers the address of your office, so that they can inform you if the pump breaks down ?










made a note of any problems with the tubewell or the hand-pump, so that you can report them to the District/Block Engineer?



# chlorination

Occasionally tubewells get polluted. This may happen if there are natural calamities such as floods, or if the hand-pump platform gets damaged. You will then need to disinfect the tubewells.

## How to chlorinate a tubewell:

-  Put 5 match box full or 300 grms of Bleaching Powder in a Bucket of water.
-  Mix it thoroughly.
-  Lift water tank and clamp riser pipe in the raised position. (Follow step (1) to (12) given on page 49 excepting removal of water tank).
-  Pour chlorine solution into the tubewell.
-  Place the water tank on stand assembly flange and fix head assembly. (Follow steps shown on pages 30, 32 and 35 to 45).
-  Pump. Stop pumping when the water smells strongly of chlorine.
-  The handpump should not be used for at least *one hour*. It would be better if the handpump is used after 6 hours.

# **Step-by-step procedure for pump overhaul**

**Before you move out to any hand-pump site, consult the India Mark-II Hand Pump installation and Maintenance Manual for the checklist of tools and materials and ensure that you have all the tools and materials with you on the vehicle. Before starting work, ensure that all the tools you will require are within reach. You can spread out a gunny bag or a plastic sheet to place tools and components so as to protect them from dirt.**

## **DISMANTLING THE PUMP**

1. Remove inspection cover from head assembly.
2. Insert chain coupling supporting tool.
3. Lift the handle to the top position and then disconnect chain from handle by removing the nyloc nut and bolt.
4. Take out handle-axle. When removing, use handle axle punch to protect axle thread and remove handle from head assembly.
5. Remove flange bolts from head assembly.
6. Insert one lifting spanner into the holes provided in the head assembly and lift up.
7. Fit the connecting rod vice on to the water chamber top flange and tighten vice against connecting rod and allow the head assembly to sit on the connecting rod vice.
8. Unscrew lock nut and then rotate the head assembly to disconnect the chain and then remove lock nut and conversion head.
9. Support connecting rod with connecting rod lifter, loosen connecting rod vice and remove. Gently lower connecting rod. Remove connecting rod lifter.
10. Remove water tank bottom flange bolts.
11. Lift water tank by using tank pipe lifter and lifting spanners.
12. Fit self locking clamp and remove water tank.
13. Disassemble rising main and connecting rods.

14. When you reach the last length of pipe remove self locking clamp and pull out the last pipe & cylinder by hand.
15. Disconnect cylinder from the last pipe.
16. Check all the pipe threads; clean out the threads by using wire brush. Remove any dirt and rust from the pipes by using wire brush or sandpaper. If any pipe is damaged, replace. Ensure that all the pipe couplings are intact and fit properly.

## **CONNECTING RODS**

Check all the connecting rod threads and couplings. Clean out threads with the wire brush. Remove any dirt and rust from the rods by using wire brush or sandpaper. Re-thread connecting rods if required. Check each rod for straightness. If rods are bent, try to straighten them. If not possible, replace.

## **CYLINDER OVERHAUL**

Unscrew top and bottom reducer caps using pipe wrenches. Remove piston assembly and check-valve. Inspect piston and check-valve assembly and replace any wornout components. If necessary replace leather cup-washers, leather sealing ring, rubber seating etc. Check for cracks which may have developed in the cylinder components. Replace parts if necessary. Re-assemble complete cylinder.

### **Cylinder Inspection**

Check cylinder assembly for any leakage. Place cylinder in a bucket of water and move piston up and down. When cylinder is full of water hold up and check whether any water is seeping through the check-valve. If so, re-open cylinder. Check piston assembly and check-valve assembly again for correct assembly and proper tightening. If necessary, replace check-valve. Lock the upper valve seat and rubber seat retainer by lock punching.

## **PUMP BODY OVERHAUL (Non-galvanised pumps)**

Clean inside of water tank and head assembly. Remove all dirt and rust inside and outside the hand-pump body. Use



wire brush and/or sandpaper to remove rust patches. Apply anti-rust paint. Assemble the hand-pump following the hand-pump installation procedures shown in this manual.

## PLATFORM CHECKING

As you know, the India mark-II hand-pump must be installed with a proper concrete platform. A Hand-pump platform is essential as it (1) Provides the foundation for the pump pedestal; (2) provides a sanitary seal; and (3) helps prevent any surface water percolating into the tubewell which may contaminate the water. Therefore, special attention must be paid to the platform condition. You should check for cracks which may have developed in the platform and check whether the pump pedestal is tightly secured to its foundation.

If the platform has any cracks, or if the pedestal is loose, do the following:

- i) Fill up cracks in the platform with cement. Make sure that exposed platform is again cement plastered.
- ii) To reinforce the hand-pump pedestal base, dig out a circular space around the pedestal and fill this up with a 1:2:4 concrete mixture. Whenever cement plaster for concrete mixture is reapplied to an existing platform, seven days curing time should be allowed. Disconnect the handle from the chain so that nobody can operate the pump and ask the villagers not to use the hand-pump for the duration of the prescribed time. The required setting can be reduced to 24 hours if a quick setting cement compound is used.

## CHLORINATION OF THE TUBE-WELL

On completion of the overhaul job, the tubewell should be chlorinated.

### Remember

- No dirt should enter the tube-well while lowering pipes and rods since this may seriously contaminate the tube-well water.
- To clean all the hand-pump components thoroughly before assembly.
- To tighten all nuts and locks nuts as well as connecting rod couplings and riser pipe couplings.

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05-11-0

COMMUNITY HEALTH CELL

358, V Main, I Block

Koramangala

660034



# Tools required for Hand Pump mobile installation and maintenance team

## Standard Tools

1. Button Die (to suit 12 mm rod) M 12x1.75 Threads	1 set
2. Die set for 32 mm GI pipe	1 set
3. 600 mm pipe wrench	1 nos.
4. 450 mm pipe wrench	1 no.
5. 300 mm pipe wrench	1 no.
6. M17 x M19 double ended spanners (to suit 10 mm x 12 mm. bolts & nuts).	8 nos.
7. 300 mm screw or adjustable spanner	1 no.
8. Screw driver 300 mm long	1 no.
9. Screw driver 150 mm long	1 no.
10. 2 kg. ball pein hammer with handle	1 no.
11. Hacksaw frame with two spare blades 300 mm	1 no.
12. Pressure type oil can (½ pint with oil)	1 no.
13. Wire brush	1 no.
14. 250 mm half round file with handle	1 no.
15. 250 mm flat file with handle	1 no.
16. Lithium base/multipurpose grease	1 kg.
17. Graphite Grease	1 kg.
18. Nylon rope (3 mm thick)	75 metres

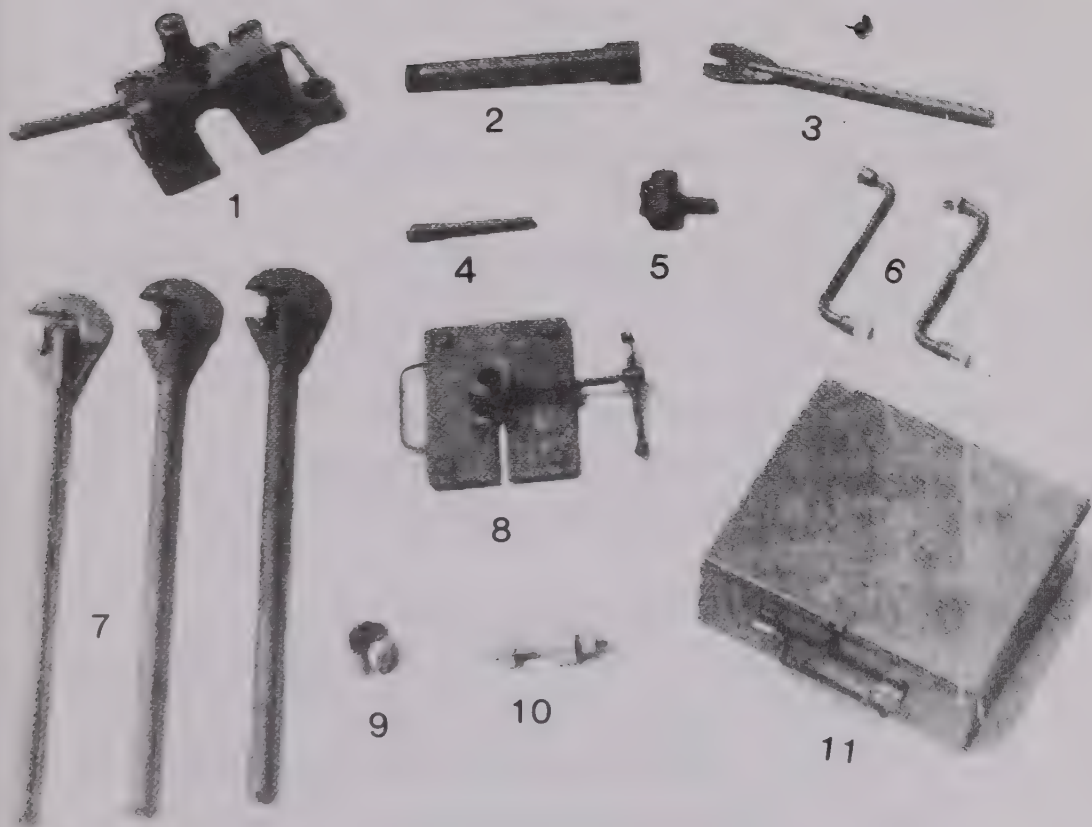
## Masonry Tools

1. Scoop	3 nos.
2. Pan	4 nos.
3. Spade	3 nos.
4. Crow bar	2 nos.
5. Spirit level 250 mm	1 no.
6. Levelling plank wooden (small & large)	2 nos.
7. 20-litre bucket	1 no.
8. 2-litre mug	1 no.
9. Measuring tape	3 metres
10. Quick-setting compound	5 kg or 5 lit
11. Tube—well cover	1 no.
12. Pedestal metal cover plate	1 no.
13. India Mark-II platform shuttering unit	1 no.

## SPECIAL TOOLS

(1) SELF LOCKING CLAMP	— 1 No.
(2) TANK PIPE LIFTER	— 1 No.
(3) COUPLING SPANNER	— 1 No.
(4) HANDLE AXLE PUNCH	— 1 No.
(5) CONNECTING ROD LIFTER	— 1 No.
(6) CRANK SPANNER	— 2 No.
(7) LIFTING SPANNER	— 3 No.
(8) CONNECTING ROD VICE	— 1 No.
(9) CHAIN COUPLER SUPPORTING TOOL	— 1 No.
(10) BEARING PRESSING TOOL	— 1 No.
(11) TOOL BOX	— 1 No.

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The special tools for India Mark II Deep Well Hand Pumps should be used by Mobile installation and maintenance team while installing or repairing India Mark-II Hand Pumps.

#### **TOOL No. 1—SELF LOCKING CLAMP :**

Use this tool for holding the rising main while lifting or lowering.

While raising the pipe, you need not operate the handle to open out the jaws, as the tool has been devised to facilitate pulling out the rising main couplers without opening of the jaws by hand. (see Page 28 for details)

While lowering the pipes, the jaws should be opened slowly and pipes should be lowered with the help of lifting spanners. Never try to open the jaws unless the lifting spanners are on the pipe and load is being taken by them. Insert the lifting spanner handle in the socket and lock one pipe wrench as shown in page 27. This will reduce one person who is otherwise required.

#### **TOOL No. 2—TANK PIPE LIFTER :**

Use this tool to lower or lift the water tank with the rising main. (Refer Page 30)

- (i) Screw it on to water tank coupling.
- (ii) Use 2 or 3 Lifting spanners equally spaced on the tank pipe lifter to raise or lower water tank assembly.

#### **TOOL No. 3—COUPLING SPANNER :**

Use this tool for tightening the connecting rod coupler faster and with ease (Refer Page 26)

#### **TOOL No. 4—HANDLE AXLE PUNCH :**

This tool is used for driving out the handle axle without damage to axle threads (Refer Page 39 & 40).

(A) For driving out the handle axle the sequence shall be :

- (i) Remove axle nuts and washers.
- (ii) Put handle axle punch on taper portion of axle.
- (iii) Hammer gently handle axle punch until you are able to pull out axle by hand.



**(B) While driving the handle axle, the sequence shall be as under:**

- (i) Insert the handle axle punch through left bush and bearings.
- (ii) Insert the handle axle through right bush so that threaded portion goes into the handle axle punch.
- (iii) Hold the handle axle punch by one hand and hammer gently the handle axle.
- (iv) Hammer the handle axle till the handle axle threaded portion comes out through left bush. The handle axle punch would have come out by then.

#### **TOOL NO. 5—CONNECTING ROD LIFTER :**

Use this tool for raising or lowering the connecting rod (refer page 32).

- (i) Thread on the tool to the connecting rod.
- (ii) Insert lifting spanner.
- (iii) Lift or lower as required.

#### **TOOL NO. 6—CRANK SPANNER :**

use crank spanners for tightening or loosening flange bolts. Check nuts, nyloc nut and anchor bolts (refer page 41, 42 & 45).

#### **TOOL NO. 7 : LIFTING SPANNER :**

Use this tool to raise or lower rising main. These lifting spanners are suitable for 32 mm (1 1/4") N.B. pipes (refer page 28, 29 and 30).

- (i) Lifting spanners should be spaced equally around the rising main.
- (ii) use two lifting spanners to lower or lift upto 30 meters of rising main.
- (iii) Use three lifting spanners if the rising main is longer than 30 meters. Do not use pipe, wrenches for lifting or lowering the rising main.
- (iv) You can also use one lifting spanner to lock the pipe with the help of a pipe wrench (see page 27)

#### **TOOL NO. 8—CONNECTING ROD VICE**

Use this tool for holding the connecting rod, while connecting rod is cut and threaded (refer page 32 and 38).

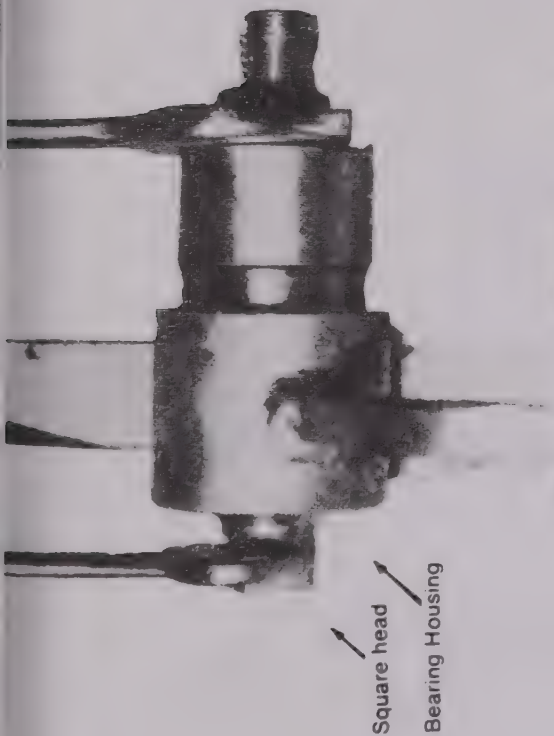


### **TOOL NO. 9 CHAIN COUPLER SUPPORTING TOOL**

Place this tool between the chain coupler and the flange of conversion head assembly. This facilitates easy fixing of chain on to the handle assembly as the entire rod weight is supported by this tool (refer pages 37, 42 and 43).

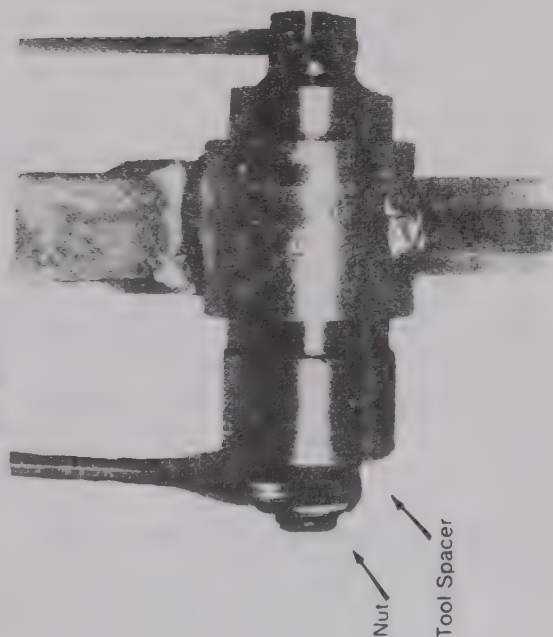
### **TOOL No. 10—BEARING PRESSING TOOL**

With the help of this tool bearings can be fitted very easily in the bearing housing of handle assembly (see page 57 for details).



## Step 1

1. Insert the tool till the boss sits in the bearing housing.
2. Insert bearing from threaded end side.
3. Insert tool spacer to be followed by nut.
4. Hold the square head with spanner.
5. Tighten the nut till bearing is flush with the bearing housing face.



## Step 2

1. Insert the tool through bearing already in position
2. Insert one pump spacer, bearing, followed by the tool spacer and nut.
3. Hold the square head with a spanner.
4. Tighten nut till bearings and pump spacer are locked.

**Note:** Use of this tool ensures proper fixing and locking of bearings and pump spacer.

## Bearing Pressing Tool

# **Recommended spares for each india mark II deep-well hand-pump**

## **for two year normal operation**

<b>Spares for Pump-Head</b>	<b>Quantity</b>
1. Hexagonal bolts M 12 x 1.75 x 40 mm long	8 Nos.
2. Hexagonal nuts M 12 x 1.75 mm	18 Nos.
3. Washers M 12	10 Nos.
4. High Tensile bolt M 10 x 1.5 x 40 mm long	1 No.
5. Nyloc nut M 10 x 1.5 mm	2 Nos.
6. Handle axle (Stainless Steel)	1 No.
7. Washer (4 mm thick) for handle axle	1 No.
8. Bearing (No. 6204 Z)	2 Nos.
9. Spacer	1 No.
10. Chain with coupling	1 No.
11. Bolt for front cover M 12 x 1.75 x 20 mm long	1 No

### **Spares for Cylinder :**

1. Leather cup washers	4 Nos.
2. Leather sealing rings	6 Nos.
3. Rubber seating (big)	1 Nos.
4. Rubber seating (small)	1 Nos.

### **Spares for G.I. Riser pipe :**

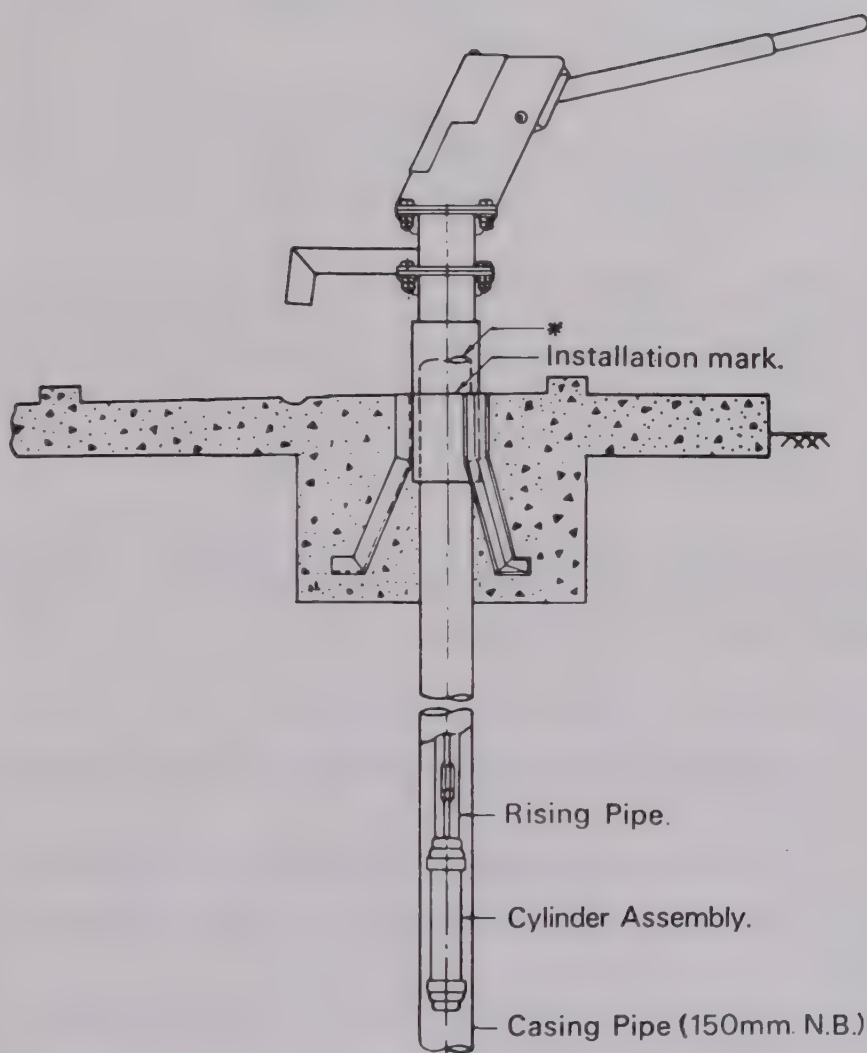
2. Pipe sockets for 32 mm N.B. medium grade G.I. pipes.	4 Nos.
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## TROUBLE SHOOTING \*CAUSES \*REMEDIES

TROUBLE	CAUSE	REMEDY
1) Pump handle works easily but no flow of water:	(a) Water level gone down below the cylinder assembly	(a) Add more pipes and rods.
	(b) Worn out cylinder leather cup washer.	(b) Overhaul the cylinder and replace the leather cup washer.
	(c) Connecting rod joint disconnected.	(c) Pull out the pump and join the connecting rod wherever necessary.
	(d) Valve seats worn out.	(d) Replace valve seats.
	(e) Pump cylinder cracked.	(e) Replace cylinder assembly.
2) Delayed flow or small flow.	(a) Damaged rising main	(a) Replace the damaged pipe or disconnect the affected rising main.
	(b) Leakage in cylinder check valve or upper valve.	(b) Overhaul cylinder. Replace rubber seats.
	(c) Leather cup washers worn out.	(c) Overhaul the cylinder and replace leather cup washers.
3) Folding of Chain during return stroke.	(a) Improper erection.	(a) Adjust the length of last connecting rod suitably.
	(b) Leather cup washers getting jammed inside the cylinder.	(b) Overhaul the cylinder and replace leather cup washers.



- |                            |  |                                  |
|----------------------------|--|----------------------------------|
| 4) Noise during operation: | (a) Stand assembly flange not levelled properly. | (a) Level the flange.            |
|                            | (b) Bent connecting rod.                         | (b) Change the defective rod.    |
|                            | (c) Hexagonal coupler welded off-set.            | (c) Change the defective rod.    |
| 5) Shaky Handle:           | (a) Loose handle axle nuts.                      | (a) Tighten handle axle nuts.    |
|                            | (b) Worn out ball bearings.                      | (b) Replace ball bearings.       |
|                            | (c) Spacer damaged. or short in length.          | (c) Replace spacer.              |
|                            | (d) Bearings loose in the bearing housing.       | (d) Replace the handle assembly. |



\* For Casing Pipe of 6" (150 m.m.) N.B. use of Telescopic Stand Assembly as shown above.

# WATER IS LIFE !

Air, Water and Food are the three basic needs for the survival of human beings.

It is very important that the drinking water should be safe and potable. Water is available from different sources, but all is not safe and dependable.

The ground water from deeper depths is safe and dependable, which is located and tapped by drilling deep tubewells to a depth of about 50 metres.

In order to bring the safe water above the ground for use, a India Mark-II Handpump should be installed over the tubewell properly with good concrete platform, adequate drain and footstand. This would prevent contamination of the safe tubewell water, ensure strong foundation and trouble-free longer life of the pump.

The properly installed pump with good concrete platform should be maintained periodically and operated properly by the users.

Therefore, for longer life of the pump :

- 1) The pump handle should be operated fully to the top and bottom for full flow of water.
- 2) The handle chain should be lubricated with grease.
- 3) The bolts and nuts with the pump should be kept always tight.
- 4) The excess water from the pump should be disposed off to a garden or a soak pit.
- 5) The pump surroundings should be kept clean.
- 6) The community should safeguard the handpump as their own property.

*Drink handpump water for better health !*

*Health is Wealth !*

notes





# notes



**notes**



notes









International Drinking Water  
Supply & Sanitation Decade  
1981-1990

**unicef**   
United Nations Children's Fund